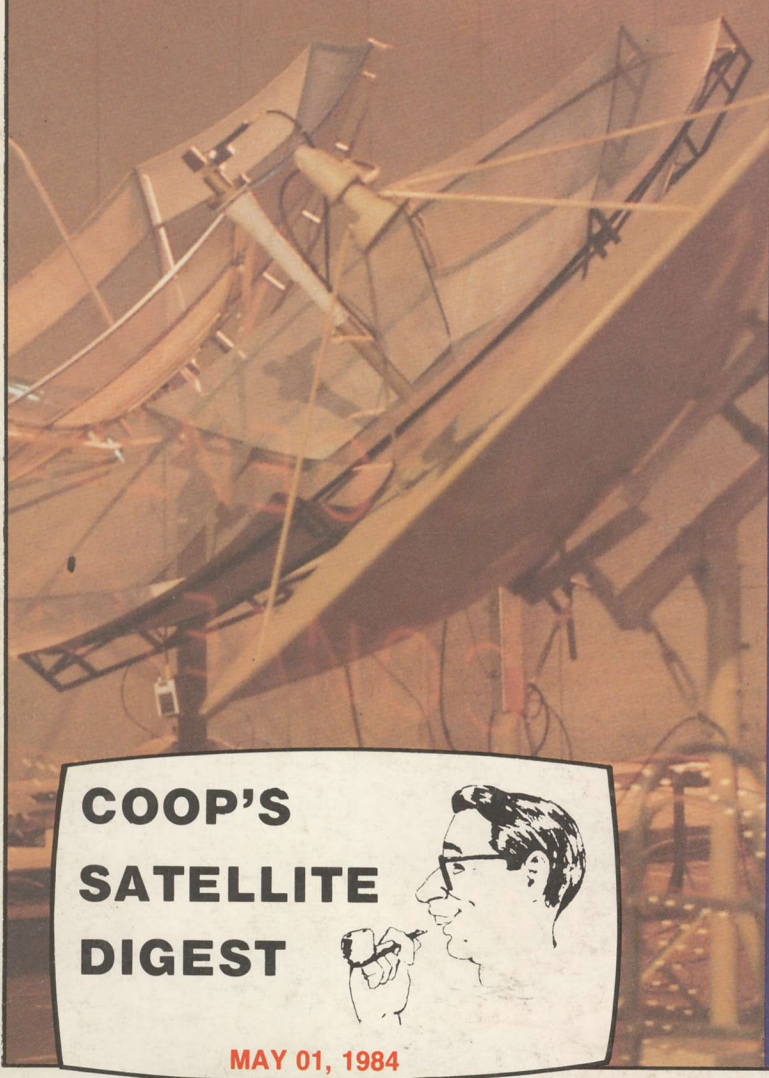
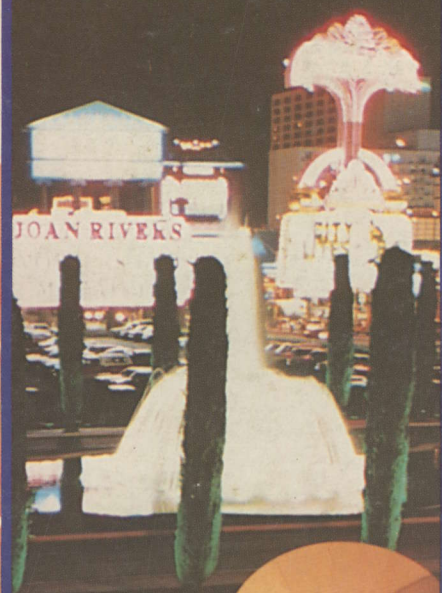


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**COOP'S
SATELLITE
DIGEST**



MAY 01, 1984

Time to upgrade . . . ?



Satellite Receivers for All Your Needs

NEW!

Toll-free OrderLine 800-446-2500 (Orders Only!)

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TOP OF THE MONTH

TWEEKING. All these people putting in all of those dishes and eyeballing the screen for "That's It!" performance peeking. Mercy. We take a good look at the 'Art Of Tweeking' and the tools that go with the trade this month.

AC powering in SMATV/CATV plants. There is probably more to line-powering than you thought. We find out about positive and negative 'half cycles' and what they mean, also here, this month.

SURVEY time. That now-annual event where we ask **you** to rate various brands of equipment for performance and reliability. Be sure to fill out your forms!

SOUTH American domestic satellite systems are coming. **Elio Sion** of Hughes tells us when and where and what they will mean for TVRO sales beyond the Caribbean, in this issue.

DEALER advertising and the restructuring of SPACE are but two subjects pondered by Coop in his comments section this month. A report on the SPACE/CSD shows in March? You missed it; appearing in the April 15th issue of **CSD/2**.

AHEAD? Niagara Falls, June 11-14. See you there!

MAY 1984

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OUR COVER/ no 'night and day' comparisons here. SPACE/STIA brought an estimated 6,000 to Las Vegas for their trade association show and convention March 18-20 (left) while STTI attracted a slightly larger crowd to their March 20-22 affair. Head to head shows turned out to be less of a problem than most had anticipated, but as one wag repeatedly put it . . . "Never again!". Coop comments, in this issue.

COOP'S
SATELLITE
DIGEST



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The BR Futureproof™ Warranty. It Protects Something More Valuable Than Equipment: Your Reputation.

Word of mouth advertising from customers can make you or break you. So make sure you get compliments—not complaints—with BR's exclusive "Futureproof"™ five-year warranty. It's the first opportunity for TVRO customers to buy an extended protection plan for their systems at the time of purchase just like they buy for their cars.

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Immediate Free Replacement Service.

BR Satellite is the only distributor in this industry who will replace any defective TVRO product with a new unit, just by making one toll-free phone call. Before you send the defective unit back and at no cost to you.

The "Futureproof"™ Decal—a Sign of Success.

If you've got it, flaunt it! The "Futureproof" warranty sticker in your store window could be your best salesman. We'll send brochures and in-store displays, too.



Our Standard Warranty—Still the Ultimate, Still Free.

Every piece of equipment we sell is backed by our unconditional replacement policy for a full year.*

It's an irresistible sales tool, and it won't cost you or your customers a cent.

We'll ship a replacement via UPS Blue Label, at our expense, the same day you call us. We ask only that you ship the defective unit, at your expense, within 5 days *after* you receive the replacement.

At BR Satellite, there is no "turnaround" waiting time. And only a bare minimum of your valued customer's down time.

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BR SATELLITE is the only distributor in this industry who will replace any defective TVRO product with a new unit. We'll ship a replacement via UPS Blue Label, at our expense, the same day you call us.

With Norsat's LNA, Your Customers Will See Less Noise. With Our 1 Year Warranty, You'll Hear No Noise From Them.

Introducing the quiet one—the remarkable Norsat LNA! Norsat has combined years of experience with traditional Japanese manufacturing excellence to produce a low noise amplifier of exceptional quality.

Quiet quality, for better pictures even on today's smaller dishes. Degree for degree, dollar for dollar, the Norsat is simply the quietest, most efficient LNA ever made.

Unique all GaAsFet four stage design (no bi-polars) with min. 51 db gain.

Total weatherproofing—precision milled recessed top cover; computer-milled aluminum body.

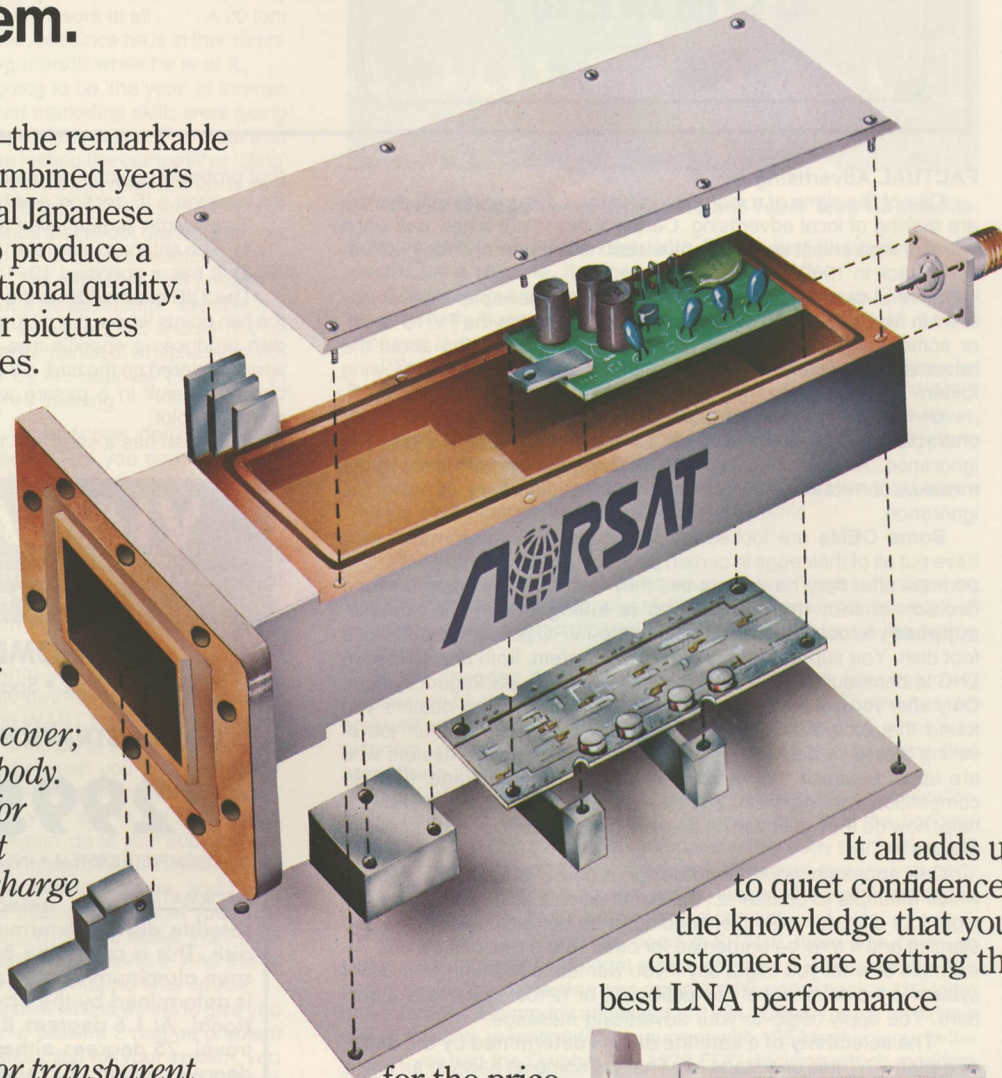
Grounded input probe for maximum protection against failures due to lightning discharge or high ambient RF fields.

Triple sealed and ruggedly mounted type "N" output connector.

Low VSWR resonator for transparent impedance match into the first GaAsFet stage.

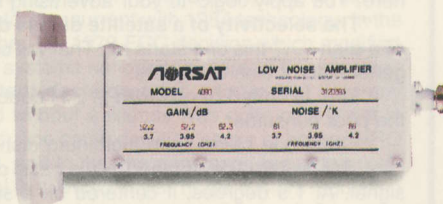
Separate power supply board featuring ultra-stable regulation with built-in protection against polarity reversal, voltage fluctuation, and static discharge.

Available in 100°, 90°, 85°, 80°, and 75° noise temperatures.



It all adds up to quiet confidence—the knowledge that your customers are getting the best LNA performance

for the price. BR Satellite is proud to be the only distributor in the Eastern United States for Norsat LNAs, and one of only three distributors nationwide.
Quantity Prices Available.



"We Distribute Trust."
Dealers Only.

NORSAT

COOP'S SATELLITE COMMENT

- ADVERTISING Claims and Basic Truths
- WANTED/ 12 Strong Men
- SCPC Column Begins

FACTUAL Advertising

One of the signs of a maturing industry is the greater use dealers are making of local advertising. Certainly this is not a new use since some of the earliest dealers began local newspaper and radio advertising back in 1980.

Several days per week I'll find a clipping of a newspaper advertisement in my mail; sent by either the guy who operates the TVRO 'shop' or some competitor who wants me to notice something about the advertisement. I read each one, and file them away in a growing folder.

Of late I have noticed a trend towards what I would have to characterize as 'less-than-truthful' advertising. Some of it I chalk up to ignorance. And that's OK as long as the guys who are making the mistakes correct themselves when they learn differently. Not all of it is ignorance.

Some OEMs are locked into particular package formats; they have put all of their eggs in certain packaging of TVRO hardware, and perhaps after they have done this they find that they made a wrong decision or two; **the competition is killing them**. For example, **suppose** you decided to build a complete TVRO package around an 8 foot dish. You supplied every part of the system, from dish to feed to LNC to demodulator and all of the cables. A nice, packaged, system. Only after you got out there and set up six hundred or so 'dealers' you found that others, with more flexibility, were doing a better job of selling their own packages. Now you have six hundred dealers who are upset because they agreed to handle **your package**, and the competition is killing them. The dealers naturally look to the OEM for help; how do they get back on an even par with their local competitive dealers?

One approach would be to design a dealer advertising program which attempts to counteract the competition's sales messages. An eight foot dish, for example, is going to be borderline with 2 degree spacing and it may be borderline for other (gain) reasons as well. An example of what you might say if you wanted to promote your 8 foot system to the detriment of competitive 10 or 12 foot systems is shown here. You apply 'logic' to your advertising message.

"The selectivity of a satellite dish is determined by the depth of a dish . . ." this one starts off. That will come as news to an entire generation of dish designers.

"This is called bandwidth . . ." I doubt that. But it reads well to the poor consumer.

"XXX's one piece spun aluminum dish is rated at 1.5 degree's (sic). Bandwidth is determined by the travel of a dish through a satellite signal. At 1.5 degrees, if centered on a signal, you can travel .75 degrees either way to be out of signal. At 2 degree spacing (if 2° spacing) this still leaves .5 degrees between signals . . ."

Hummm. You can certainly 'learn' a lot from a newspaper advertisement! Let's see where this chap has gone wrong.

The '**selectivity**' of a satellite dish is **not determined** by the depth of a dish; it is determined by the **size** of the dish and the **design** of the feed. Of the two, the size of the dish is the leading factor. You can take an 8 foot dish and make it .5 or .4 or .3 and you will (with appropriate changes in feed design) only cause minor differences in the 'selectivity' of the dish.

'Bandwidth' is the wrong phrase of course. They wanted to use

(but probably couldn't remember) 'beamwidth.' Bandwidth relates to the receiver's IF section and has no use in antenna discussions.

'Beamwidth' is quantified as follows:

- 1) The antenna (plus feed) has a specified '3 dB beamwidth,' and,
- 2) It has a specified 10, 12, 15 or 20 dB beamwidth.

The 3 dB **beamwidth** is the width of the antenna's pattern between the two points where the picture drops off 3 dB; in other words, if your dish produces a sparklie free picture (but with no margin to spare) when centered on the bird, a 3 dB reduction (as the dish moves off the bird) will result in a picture which is laced with sparklies and has unstable color.

If the dish has a specified 12 or 15 dB 'beamwidth,' that is useful

VIA SATELLITE

everything you wanted to know about satellite
Wed. March 7 at 5 p.m.

HOME SATELLITE TV SHOW

- Designed for 2 • Spacing ★ Leader in Technology

DEMONSTRATIONS DAILY

\$2995⁰⁰

COMPLETE SYSTEM • INSTALLED*

INFORMATION The selectivity of a satellite dish is determined by the depth of a dish. This is called the Bandwidth. one piece spun aluminum dish is rated a 1.5 degree's. Bandwidth is determined by the travel of a dish through a satellite signal. At 1.5 degrees if centered on a signal, you can travel .75 degrees either way to be out of signal. At 2 degree spacing (if 2° spacing) this still leaves .5 degrees between signals.

BIG ISN'T BETTER

when talking spacing. A 20' flat dish won't work at all. As technology advances the size will get smaller. The trend is smaller not larger.

SHARE A SATELLITE

It's now possible for several homes to hook up to one dish with independent tuning.



Some Limits Apply

Call For Information

information since this tells you how many degrees (or parts of a degree) the dish must move before **all signs of signal** are gone. The advertisement suggests that the example antenna has a 1.5 degree beamwidth at the point where you would "... be out of signal ...". That tells us they are promoting a dish that they 'claim' has at least a 10 dB and probably a 12 dB specification at the 1.5 dB point. That's a good trick with an 8 foot dish. The point here is simply that if the person preparing the advertisement has 'bandwidth' confused with 'beamwidth' chances are he also doesn't understand 'being out of signal.'

The advertisement goes on "**Big isn't better** / ... when talking spacing." On the surface, that is **totally untrue**. But he cleverly qualifies it with "... a 20 foot **flat** dish won't work at all ...". A 20 foot **flat surface** wouldn't be a dish, of course, but since he is in this 'deep' already he might as well go for the big untruth while he is at it.

We said in January that this was going to be 'the year' of intense competition; that people with sharpened marketing skills were going to be entering the marketplace for a piece of the action. The chap who wrote this advertisement apparently was feeling the competitive 'sting' of one or more sharp marketing types, and we can deduce that as they did their own advertising 'knocking' his 8 foot dish system (and possibly instilling fears in the consumer minds that 8 foot dishes were not going to work with 2 degree spacing), he of course reacted.

A fellow selling a smaller dish (9, 8, 7 or whatever 'feet') needs to be a strong marketing person. He **IS** at a disadvantage, especially if that is the **ONLY** size he has to sell. However, **HE** should not be responsible for the 2 degree spacing performance of what he sells; not unless he has been **GUARANTEED** by his supplier that the dish system will, indeed, perform at 2 degree spacing.

My suggestion to dealers is this. Number one, don't be the 'fall guy' for the manufacturer. If your supplier has you convinced that small (8', etc.) dishes are the greatest thing since sliced bread, **make him put in writing**, to you, that **HE** will be responsible for 2 degree spacing performance. In other words, ask for, **demand**, a written guarantee that the dish system he is peddling to you, for re-sale, will function properly with 2 degree spacing. If he is not willing to make that representation to you, in writing, where **he can be held** 'accountable' when 2 degree spacing arrives, then perhaps you are dealing with the wrong supplier.

Number two, don't elaborate on what you are 'told' by a sharp salesman. The temptation to 'go a little further' with your own retail description of your product is great. You **WANT** that sale and you are going to 'stretch' your own facts, or be tempted to stretch those facts, when you have a customer wavering between you and somebody else. Under virtually every state consumer-protection law I have read, **YOU can be held responsible** for what you 'say' in the sales pitch, even if you never put it in writing. Once again, go to your supplier and **demand** a written guarantee that the dish system **WILL** function with 2 degree spacing. Post that letter on your wall in a frame, and make copies for each sales book. When the customer balks at your dish size, flip to the letter and show it to them. This is far better than **YOU** guaranteeing it; it is the original supplier guaranteeing it. And this is one guarantee that should be endless; i.e. it has no time limit.

Assuming you are dealing with a supplier who is willing to give you that written statement, you can turn your present 2 degree problem into a sales plus. As you make your sales pitch for your system, you can throw in "**And our system is guaranteed against 2 degree spacing, for life!!!**". If you handle it right, the customer will think of 2 degree spacing as something akin to the Bubonic Plague, and here you are guaranteeing them they will never be afflicted with 'that dreaded disease!'

(Which could lead to an entire new generation of commercial advertising. "You say your dish will NEVER get those 2 degree things"?)

"**No sir! We have a lifetime guarantee against 2 degrees.**"

"That's amazing. I have been told that '2 degrees is coming' and that when it does, some dishes will be wiped out."

"**No question about it. It is here already, over on the data satellites on the east end of the belt. It is like a cancer eating its way west. Give or take a year, we'll have it over here on F3R by 1988 or so.**"

"How can you guarantee it won't infect my dish?"

"**The manufacturer does it, sir. They have taken this special**



SETTING the stage for the 'Brown Round-Table' feed via satellite.

formula and injected the dish with it. It is just like going to the doctor for a vaccine. It is permanent, for life."

"I heard about some of these small dishes down in Florida that have already been hit by the 2 degree thing. A guy told me the 'disease' is spreading west at about one time zone per year."

"**Yeh, I read that Florida might get it first. It is probably a plot from those DBS guys. They had some sort of meeting at 'WARC' or someplace like that and they figured this one out. However, this baby (slapping dish with his hand) will stand up to it! A lifetime guarantee; that's the way WE Play this game!**"

Fade into sunset and pan to a gigantic cloud formation that bears a striking resemblance to Arthur C. Clarke's profile.

THE 'Surprise'

SPACE had a surprise tucked away at Las Vegas. It came on Monday evening at 7 PM, via satellite. It was an announcement of seemingly block buster proportions. Some cynics found the timing 'curious.'

If you attended the Board of Directors meeting, you heard no discussion of the expected Monday night event. There was no announcement, no explanation or even an inkling of what was planned. You had to be tuned into the 'rumor mill' to know that **something** 'big' was up.

If you read the SPACE 'program' carefully, you also had no indication that **something** was scheduled. It told you, only, that the banquet was to start at 6 PM; the **official** rationale for the 'early start' being that the Joan Rivers/Smothers Brothers entertainment required an early start. The real reason was the uplink timing; the uplink being an integral part of the 'block buster' announcement.

For as long as there has been a SPACE there has been an uncertainty regarding the legal status of home TVRO viewing. The only relevant law in this area was committed to paper back in 1934; the now infamous 'Communications Act of 1934.' Clearly, such an old law needs massive re-writing to stay current with 1984 technology. In the interim, we had the October 18, 1979 FCC decision which modified FCC rules so that TVRO systems no longer required FCC licenses.

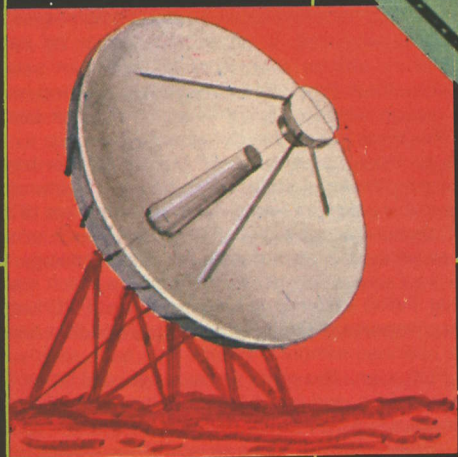
That was a very important decision since prior to that date any TVRO that was operated without a license was quite clearly not in conformity with FCC rules. The same decision spoke of home TVRO systems in general terms, and in the fine print language of the decision, the FCC decided that they would 'revisit home system regulation at an early date.' They have never done so, and in the nearly five years since that date we have stumbled along 'free,' but still shackled by the chains of uncertainty. We have situations such as the Wichita case and the present zoning-regulation problems because of those uncertainties.

There are two bodies where the rules could be rewritten to **specifically authorize** home TVRO systems. One is the FCC, and the other is Congress. The FCC has been repeatedly approached on this subject and they have shown a reluctance to get involved. They had

Satellite Financial Planning brings Bank Rate Financing on home TVRO systems.

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...the Most Complete Three Year
Extended Limited Warranty Protection
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FINANCING AND EXTENDED
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- Flexible Payments—Revolving Payment Plan
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Dealers...

**NOW FOR THE FIRST
TIME YOU CAN**

Start!



EFFECTIVE MARCH 1, 1984

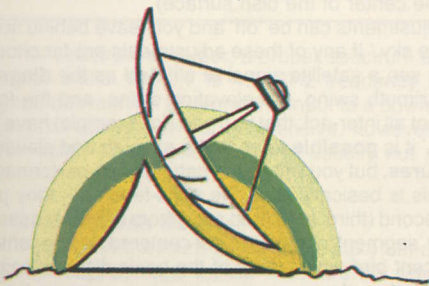
"WARRANTY NOW OPTIONAL"

"The Extended Warranty Protection Plan is now completely optional. Loans for TVRO systems and other electronic equipment are available, independent of the Warranty coverage."

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- No Down Payment
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- Up To 6 Years and Longer Repayment Period
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- Low Monthly Payments****
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- All Current TVRO Equipment Covered Under The Warranty Program

*RATE AS OF OCTOBER 5, 1983.



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PLANNING CORPORATION**

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*Upon Approved Credit

***Customer Can Change Mode of Payment Without Penalty

**\$40.00 Deductible — See Sample Warranty

****Illustration: A Typical \$2500.00 System with 3 Year Warranty — \$65.50 Per Month

*****Simply Dial 800-932-DISH Instantly Starts the Credit Approval Process

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Please send me information regarding financing and extended limited warranty for the home TVRO user.

Name _____ Telephone() _____

Address _____ City _____

State _____ Zip Code _____

TWEEKING FOR MAX/

THE ART OF BEING GOOD AT WHAT YOU DO

THE 'Last' dB

Not very many years ago nobody had ever heard of a 'polar mount' and the only mounts sold for TVRO antennas were called **Az-El** mounts. An Az-El mount is a strange animal with totally separate adjustments for **AZimuth** and **ELevation** and as you can imagine, you don't walk across the Clarke Orbit Belt with an Az-El mount. You move in small steps, first azimuth, then elevation, then azimuth, then elevation and so on down the line. Motorizing an Az-El mount required two separate motor drive systems, and the operator had to be pretty smart; he had to know how much azimuth followed by how much elevation, and so on, he needed each time he turned a crank or pushed a drive control.

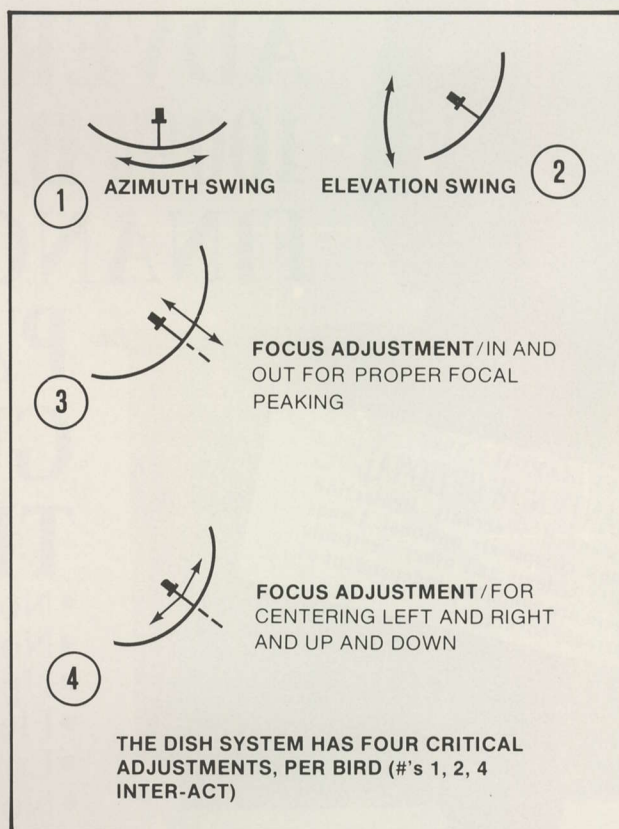
The polar mount was not actually unknown; it was simply, unproven. The professional engineers of that period (1975-77) were married to the concept that if you wanted to get the last quarter-of-a-dB out of the signals in the sky, you had to be 'dead on' the bird with the full, main beam of the dish. And they were right; the Polar Mount will never be dead on across the full belt. Let's repeat that; the Polar Mount will NEVER be dead on, every bird, across the full belt. It can come close, but it will ALWAYS leave behind **at least a part of a dB** (and often more than a dB) of signal as it scans left to right or right to left across the belt.

But the world improved. Receivers got more sensitive (lower threshold points); LNAs were ever pushing their noise temperature down (resulting in increased system sensitivity), and a fellow over in England created the first, practical, 'Scalar Feed Horn' for 4 GHz so TVRO enthusiasts could get more out of their dish feeds. By 1980 or so, people were less concerned about leaving 'a part of a dB in the sky' than they were with getting 'all of the birds' in the sky. So the polar mount, or 'declination-offset-modified' polar mount came out of the notebooks and onto the production floors all over the United States and Canada. When the polar mount became the overwhelming choice of TVRO dealers and installers, we lost our interest in gaining that last fraction of a dB of 'satellite signal' from the sky. Many of the newer dealers and installers probably don't realize that each time they elect to use a polar mount (is there any other kind, anymore?), they are making a trade off; ease of tracking across the belt, for peak performance on each and every bird.

This is about tweeking; that black-magic art of making sure that you have gotten as much signal out of the sky as you can create, given the antenna/feed/LNA/down converter/demodulator you have elected to put into the system. And more precisely, this is about the 'tools of tweeking'; the little gadgets which are available to you as you attempt to adjust your satellite terminal for maximum performance.

WHAT AFFECTS Performance?

Regardless of the type of mount you are using, you have four separate parameters involved in the alignment of the dish system; i.e., **the dish, and the feed.** A polar mount combines two of these functions (**azimuth swing and elevation swing**) into what one hopes is one, single, smooth 'tracking' action. The Az-El mount, on the other hand, separates the two. Both polar and Az-El mounts also have the **focal depth** (f/D) adjustment to make (the distance between the front 'mouth' of the feed and the center of the dish, on its surface), and, the



feed centering (the precise location of the center of the feed mouth in a direct line with the center of the dish surface).

Any of these adjustments can be 'off' and you leave behind some parts of a dB, 'in the sky.' If any of these adjustments are far enough off, you may never see a satellite signal at all! And as the **diagram here** shows, the azimuth swing, the elevation swing, and the focal centering adjustment all inter-act; that is, if you (for example) have the focal-centering 'off,' it is **possible** to peak the azimuth and elevation swing and **get pictures**, but you will not be getting peak-performance pictures. In fact, this is basically what the multi-feeds do; they purposefully offset a second (third, etc.) feed away from the proper center and then they use a 'segment' of the dish, not centered on 'the center,' to pick up an adjacent bird which is off of the basic dish 'boresight' beam. But that is another story.

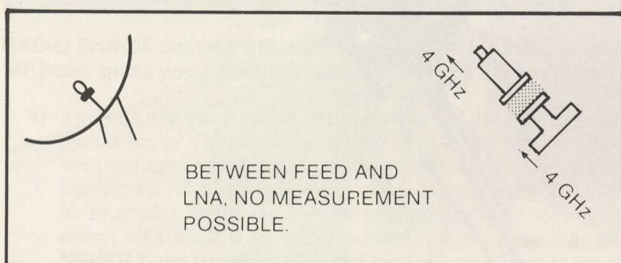
Our concern here, at this time, is the techniques you should employ to insure that whatever it is you are doing to 'tweek' and 'peak,' you have an accurate system to tell you whether changes you do are

making the picture better, or worse. You say you do this watching a television set, and glancing at the meter on the front of the receiver? Uh-huh. That's good if you don't mind leaving behind as much as 2 to 3 dB in the sky. But it is certainly not the **professional way** to do it!

Let's see what you can't do, first.

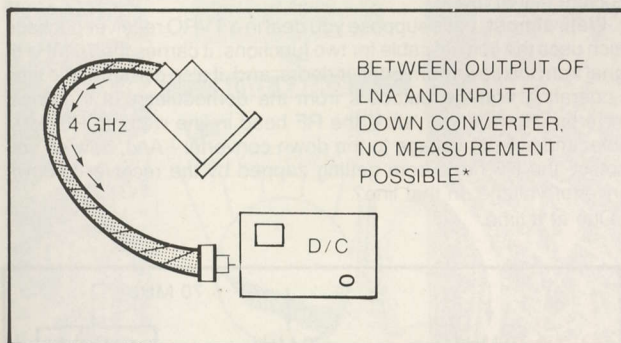
- 1) Using relatively inexpensive test equipment (meters that read signal strength, for example) you canNOT measure the signal **between the feed and the input to the LNA**. How come?

The signal here is first of all very (very!) weak; this is **before** the LNA. It is far too weak to measure with anything less than a \$25,000 spectrum analyzer and even here it is problematical that you would have success since the 'flange' on the feed is hardly compatible with the input fitting you will find on a spectrum analyzer. The signal is also still in the microwave frequency region, and in addition to being VERY weak, it is at a frequency (3.7 to 4.2 GHz) where test equipment simply does not play well. So we can forget about measuring the signal between the feed flange plate and the input to (flange plate of) the LNA.



- 2) You also cannot measure the (3.7/4.2 GHz) signal **between the output of the LNA and the input to the down converter**. How come? Isn't this **after** amplification?

It is. And so the signal is no longer 'weak' as it was between the feed flange and the input to the LNA. But, even though amplified, the signal is still amplified inside of the microwave band (3.7/4.2 GHz). That means it is strong enough to measure, but to measure it we would have to employ a test instrument which was capable of measuring signal/field strength within the microwave frequency band. You've heard of an instrument that does this? You think it is called a 'spectrum analyzer'? You are right. There is an exception to the "you can't measure here . . ." statement.

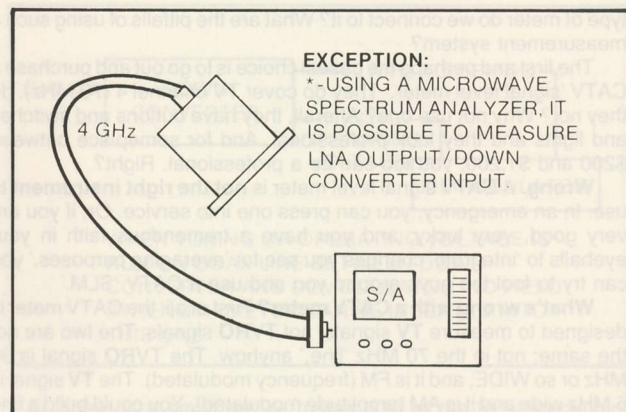


The spectrum analyzer, a proper spectrum analyzer designed to function within the 3.7 to 4.2 GHz frequency band, can measure signals between an LNA and the input to a down converter. A proper spectrum analyzer is not inexpensive, however, and since we DO have some other options, this is usually not something we even consider; for very long.

WHERE You Can Measure

If you can't measure in the microwave band (3.7/4.2 GHz) very conveniently, perhaps we can measure the signal(s) **after** we have run them through the down converter?

The primary problem with measuring 'at 4 GHz' (i.e. anyplace within the actual downlink microwave band) is first the level (or lack of level) of the signals, and, the frequency of the signals. Now, when we



connect the output of the LNA to a down converter, we do two things:

- 1) We **shift** the frequency of the TVRO signals down, to a much lower frequency, and,
- 2) We **amplify** the signals (again; the first time being in the LNA). A typical down converter has around 15 to 30 dB of signal 'gain' and when you add that gain to the original LNA gain (30, 40, or 50 dB region) you now have between 45 and 80 dB 'more signal' to measure, at the **output** of the down converter, than you had at the **input** to the LNA.

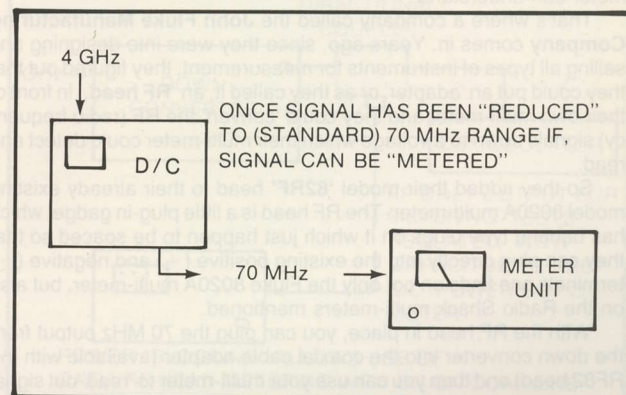
So this seems like a good place to start our measurements. Let's assume that our down converter has a 70 MHz IF 'output' (not all do, and we'll consider those that do not separately). A 70 MHz signal is (all things considered) a pretty low frequency. It is the frequency equivalent to television channel 4 (which occupies the spectrum space from 66 to 72 MHz). And in truth, the IF is merely 'centered on' 70 MHz; and if the receiver in question has a typical down converter, the IF coming out of the down converter actually covers a spectrum width from 50 to 90 MHz (40 MHz).

TV channel 4 is not very awesome; there are a number of 'measurement instruments' around which will 'reach that frequency' and measure signal levels here. So what is to stop us from simply plugging a measurement instrument into the 70 MHz output of the down converter and reading out signal strength?

Let's stop for just a minute and analyze what we are doing, and why.

We want to find a 'signal' which we can connect to a meter so we can rely on that meter to tell us when the signal gets better (stronger) or worse (weaker). We want to be able to **watch that meter** as we move the dish in azimuth, elevation; as we move the feed in and out, or position it left and right for centering. **We want that meter reading to be accurate** and we want it to have sufficient 'definition' so that when we gain (or lose) a fraction of a dB (say 1/10th dB or so) we can actually 'see that change' on our meter. In other words, we want high accuracy, fast response time on our meter (so that small changes instantly show up), and repeatable measurement numbers.

The 70 MHz IF signal would seem to be 'that signal voltage' we have been looking for. Now, how do we connect a meter to it? What



type of meter do we connect to it? What are the pitfalls of using such a measurement system?

The first and perhaps the casual choice is to go out and purchase a CATV 'signal level meter.' They do cover TV channel 4 (70 MHz), do they not? Why not use one? Afterall, they have buttons and switches and lights and they look professional. And for someplace between \$200 and \$1,200, you too can be a professional. Right?

Wrong. A CATV signal level meter is **not the right instrument** to use. In an emergency, you can press one into service. Or, if you are very good, very lucky, and you have a tremendous faith in your eyeballs to 'integrate' changes you see for 'averaging purposes,' you can try to fool the guys around you and use a CATV 'SLM.'

What's wrong with a CATV meter? First of all, the CATV meter is designed to measure **TV** signals; not **TVRO** signals. The two are not the same; not in the 70 MHz 'line,' anyhow. The **TVRO** signal is 36 MHz or so **WIDE**, and it is **FM** (frequency modulated). The **TV** signal is 6 MHz wide and it is **AM** (amplitude modulated). You could build a fine little "FM signal level meter" if you wanted to. Or, you can build a fine little "AM signal level meter." You would not build the two the same way. **FM** cannot be read, accurately, on an **AM** meter. And vice versa. Anyone who says you can read **FM** signals accurately on an **AM** meter is fooling you, and themself. Period.

The **FM** signal we try to measure on an **AM** (CATV) **SLM** is **not** a 'stationary' signal. The **AM** signal is a stationary signal. The **FM** signal has a carrier (centered near 70 MHz in most systems) but that carrier changes amplitude (signal strength) as the picture content changes. It jumps around just as the action on the screen does. When you set out to 'measure' **FM** signal strength on an **AM** (detector type) meter, you end up measuring **the changes in picture content**; and if your eyeballs are very fast, and if the meter 'movement' is fast enough, you can somehow come to some sort of 'average' reading. Good luck.

So much for (CATV type) signal level meters. They look pretty; they are impressive. And they are not worth much for **TVRO** work at 70 MHz.

So how do we really measure that 70 MHz signal since we cannot use the most common, available type of signal level meter in the marketplace? We have several choices. We could invest in an '**FM** Signal Level Meter' (they **are** available, for a pretty penny; mostly made in Europe, and not something you would carelessly leave around a **TVRO** install site unless you were not adverse to damaging \$5K up in equipment!). That doesn't seem like a very good option.

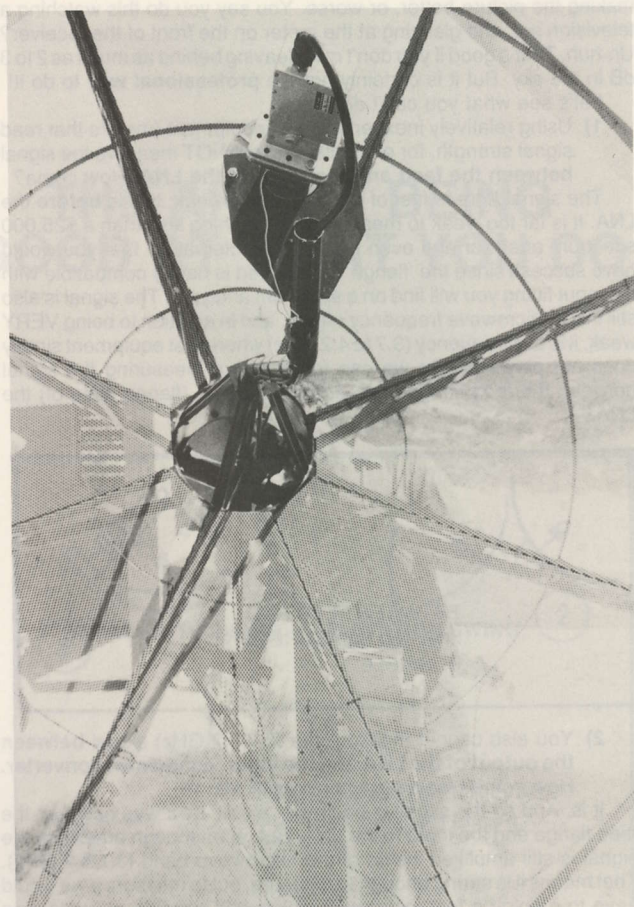
It turns out there are some very inexpensive options which should make most installers happy with their investment, and, make them far better installers in the process. Most installers have the basic part of that instrument already in their tool boxes; a digital **VOM** (multi-meter). For example, there is the Radio Shack 'Auto-Range' (models 22-196U, or the slightly fancier 22-192) meter. Now, how do you use this to measure 70 MHz 'RF' signal levels? Something tells you that the two are not directly compatible; an 'RF' signal and a 'voltage measurement multi-meter.'

An RF signal is a voltage; a 'very fast' voltage operating at a frequency which is considerably 'higher' than normal AC. It is, nonetheless, an 'alternating current' signal. What we need to do, to make our Radio Shack meter measure this 'very fast/high frequency voltage' is 'slow down' the voltage to a frequency which the multi-meter can understand.

That's where a company called the **John Fluke Manufacturing Company** comes in. Years ago, since they were into designing and selling all types of instruments for measurement, they figured out that they could put an 'adapter' or as they called it, an '**RF head**,' in front of their own multi-meter and they could 'convert' the **RF** (radio frequency) signals down to a voltage which their multi-meter could detect and read.

So they added their model '**82RF**' head to their already existing model 8020A multi-meter. The **RF head** is a little plug-in gadget which has banana type plugs on it which just happen to be spaced so that they can plug directly into the existing positive (+) and negative (-) terminals one finds on not only the Fluke 8020A multi-meter, but also on the Radio Shack multi-meters mentioned.

With the **RF head** in place, you can plug the 70 MHz output from the down converter into the coaxial cable adapter (available with the **RF82 head**) and then you can use your multi-meter to 'read' out signal

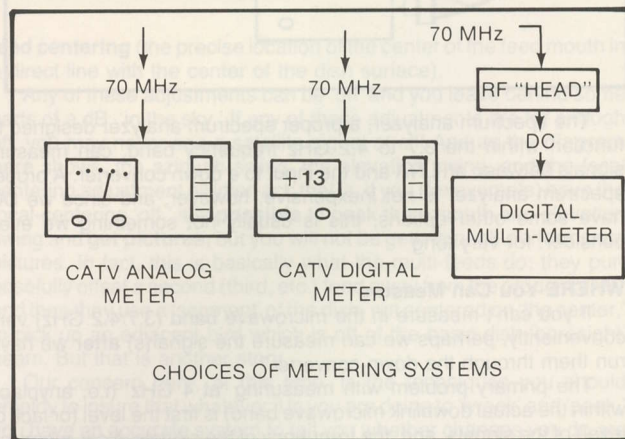


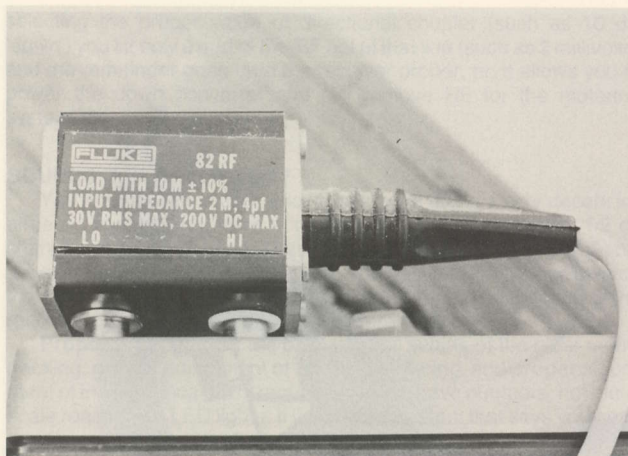
SLIDE the full feed in and out to verify that your feed is at the proper focal point in relation to the 'depth' of the dish.

levels to as close as **1/20th of a dB!** Now we have a tool we can use to measure signal levels.

Well, almost. Let's suppose you deal in a **TVRO** receiver package which uses the coaxial cable for two functions; it carries the 70 MHz IF signal from the down converter, indoors; **and**, it also carries some type of operating **voltage** outdoors from the demodulator to the down converter. How do you 'stick' the **RF head** in line with the **RG-59/U** cable, and still get voltage to the down converter? And, how do you 'protect' the **RF head** from getting zapped by the receiver-to-down converter voltage on that line?

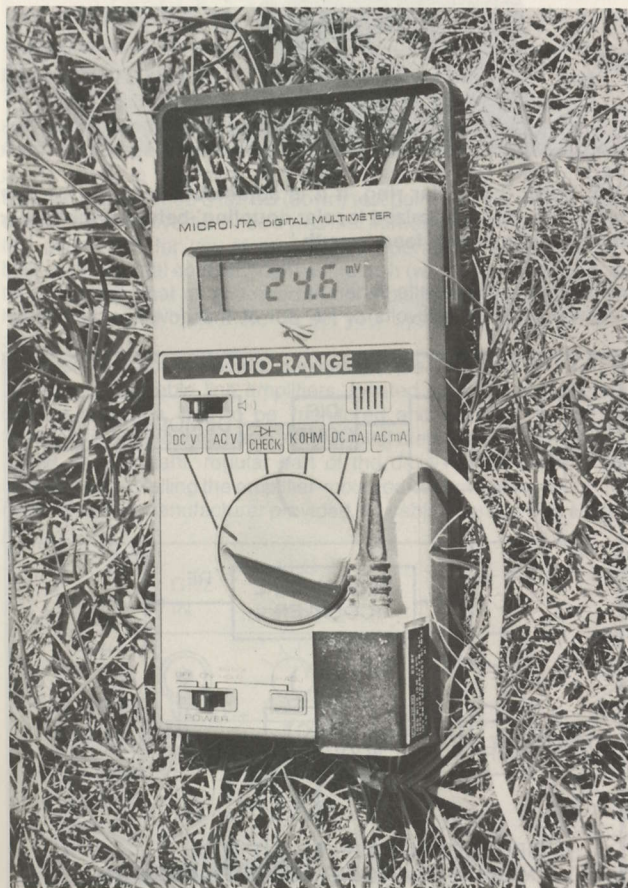
One at a time.



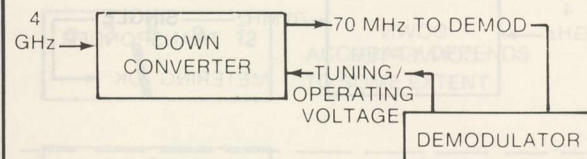


RADIO SHACK digital VOM, outfitted with the FLUKE model 82 'RF head' gives you a precise reading of 70 MHz energy present.

- 1) It may be that you do not need to worry about the 'zapping' part; the particular 'RF Head' you select to use may be 'protected' from voltages which are in the range of the up to say 25 volts DC (the 82 RF has a maximum input voltage of 200 volts DC, for example). **However**, let's **forget** that you **may** not have to worry; let's just be sure that we do this in a way that **you NEVER have to worry**; none of the "maybe I have to worry/ maybe I don't" stuff.



FLUKE (model) 82 RF head inserts directly into the multi-meter positive and negative jacks and provides a DC voltage to the multi-meter from the 70 MHz 'RF' signal.



WHEN TUNING OR OPERATING VOLTAGE IS RUN ON COAX LINE BETWEEN DOWN CONVERTER AND DEMODULATOR. NO FIELD STRENGTH METER CAN BE INSERTED INTO THIS LINE.

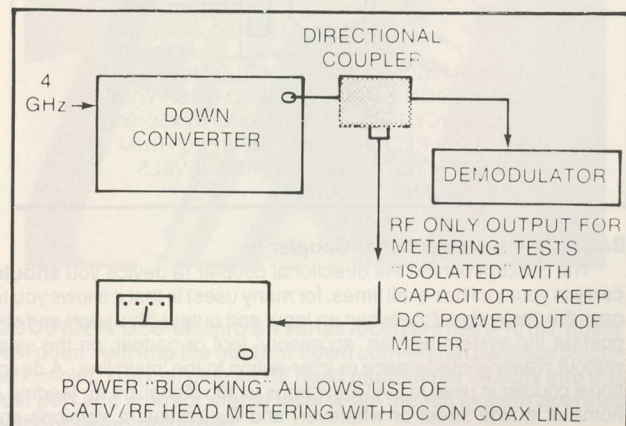
- 2) There is a small device, under \$10 at the local electronics wholesale house that sells to the CATV/MATV trade, which is your answer. You need it anyhow, as we shall see. It is called a 'directional coupler.'

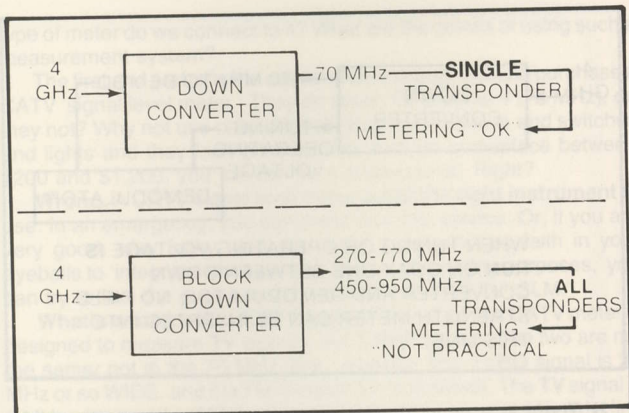
A directional coupler is a 'signal tap off device.' It has three ports on it, and you want one of the **miniature** directional couplers with an F fitting on each of the ports. There is an **input** port (that you connect to the output coming from the 70 MHz signal exiting the down converter), a **'thru port'** (this you connect to the long coaxial cable run heading inside to the TVRO receiver/demodulator), and a third port marked (appropriately) **'tap.'** The directional tap is available in several 'attenuation' values; numbers like -10dB, -20dB and so on. These numbers tell you how much attenuation (signal weakening) there is between the input port and the 'tap' port. A 10 dB or 12 dB is just fine. One thing; make sure that this directional coupler is 'power blocked.' That means that any (DC) power that appears on the through/input line will not show up at the 'tap' port. Virtually all are designed this way but it pays to be safe.

Is this just not a fancy 'two-way splitter'? Not quite. A two-way splitter virtually always allows DC voltage to flow between any two ports (such as one output to the other output), and remember, we want to avoid allowing a DC voltage, traveling from the demodulator to the down converter ON the coaxial line, getting to our 'RF head.' Our **drawing here** shows how it all hooks up; we even left in the 'option' of using a CATV signal level meter for those people who have 'averaging eyeballs' that rival Superman's powers!

Now if you KNOW that your down converter gets no voltage from the demodulator/indoor receiver via the coaxial cable (i.e. all power comes to the down converter through a separate cable, such as with older AVCOM series receivers), you **can** go ahead and hook up the RF head through the small cable link directly to the 70 MHz output on the down converter. Just ignore the TVRO demodulator/TV set for now; you don't need it **yet**, you are far too busy getting maximum signal out of the system!

What about non-standard IFs; those that do not use the 70 MHz frequency band? For example, what about those receiver systems that use the 400-900 MHz region for 'block down conversion' systems?





We have twin problems here:

- 1) First we have to determine whether or not the coaxial cable is carrying voltage one way (to the down converter), and, IF signal in the opposite direction (most of the 'low cost' BDC systems do this);

- 2) And then we have the problem of the 'high IF.'

Remember that we could **not measure** the signal between the LNA and the down converter unless we resorted to a spectrum analyzer type of device. And the analyzer is an expensive piece of gear. Could we not have somehow inserted the 'RF head' into **that** line, between the LNA output and the down converter input?

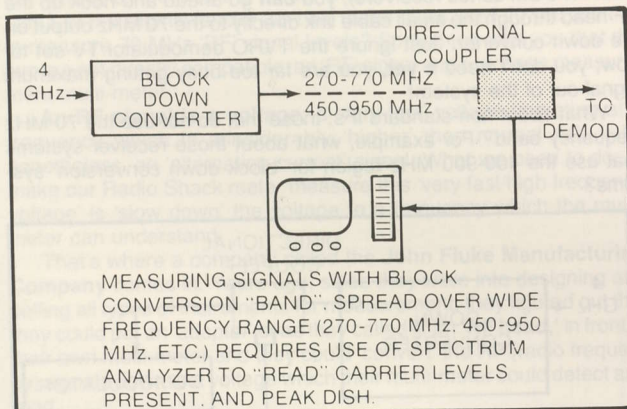
No. The 'RF head' is frequency sensitive, and 'sensitivity-sensitive.' It is not designed to operate at 3.7 to 4.2 GHz. Unfortunately, for BDC installers, it is also not much good at 400-900 MHz either.

The reason the RF head works at 70 MHz is because the 70 MHz signal is relatively **low in frequency**, and, it is quite **high in level**. A 400-900 MHz BDC system has a far higher set of RF frequencies, and, they are at a considerably lower level. The RF head will work, after a fashion, but with all of those (separate) carriers in there, it is not a dependable system. Remember our original premise:

"... a metering system we can rely upon ... to tell us when the signal is stronger, or, weaker ..."

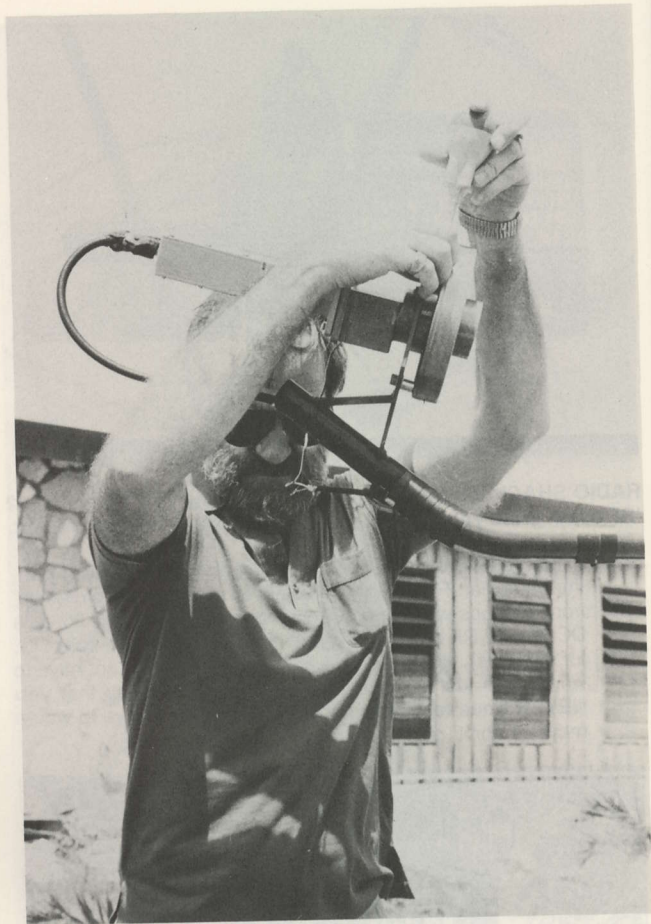
Bottom line on BDC systems and an RF head? Not dependable. Yet. There is a challenge here for a circuit designer.

So what is the BDC installer able to do? He can invest in a spectrum analyzer which, with a directional coupler, allows him to measure the signal on the CRT display screen. A suitable analyzer, that will not put you out of business, is the Texscan VSM-2.



BACK Over the Directional Coupler

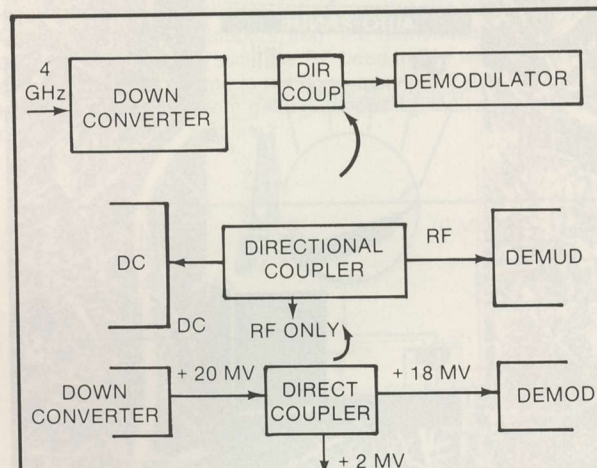
The concept behind the directional coupler (a device you **should carry** in your tool box at all times, for many uses) is that it allows you to pass the 'main signal' between an input and output (thru) port and **still** operate the system with an 'accessory' tool or gadget 'on the side' without creating interference or inter-action to the 'main line.' A directional coupler is used in CATV systems to 'tap signal' off for feeding a home or a side street or whatever; and the miniature versions are



FINE TUNE the scalar ring, if it is adjustable (such as the new Omni-Rotor) for maximized 'scalar coupling' between the scalar rings and the center feed 'mouth.'

barely as big as your little finger.

If you have 20 millivolts of RF out of the down converter, by



DIRECTIONAL COUPLER "LIFTS" A "MEASURED AMOUNT" OF RF FROM DOWN CONVERTER OUTPUT AND FEEDS TO EXTERNAL METERING WITHOUT ANY DC (OPERATING) VOLTAGE PRESENT.

selecting the proper value of directional coupler (such as 10 dB 'down') you lift only a part of the RF out of that line (such as 2 millivolts) and the remainder goes onto the receiver proper, or, it allows you to power the down converter and still remove RF for the metering system.

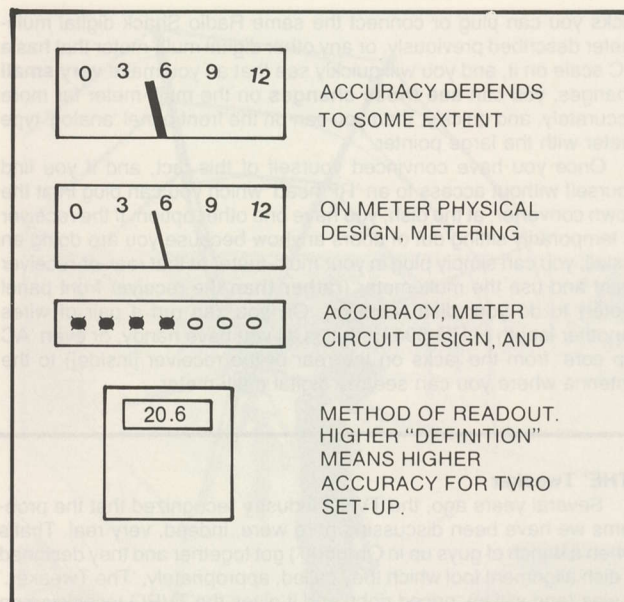
SOUNDS Too Complicated?

You may be an installer who 'thinks' he is doing a very decent job already. You feel you have a 'trained eye' and you can see '1/2 dB changes' on the TV screen. That's fine. But you could be and probably are still leaving 'signal in the sky.' Or, you may feel that you can watch the meter or LED lights that indicate signal strength on the front of the receiver. That's why they put that meter there, right!

Proper adjustment of the dish, **proper** setting of the polar mount tracking, **proper** adjustment of the feed centering, and **proper** adjustment of the feed focal point requires that you have numbers; not meter scale readings or LED lights. If you have a system that says you had a maximum of 26.2 millivolts on TR 2 **before**, and you have 26.6 **now**, you **know** you are going in the 'right direction.' The same change, on a front panel meter or set of LED lights would be virtually unnoticeable.

You can prove it to yourself. We'll see how shortly. Most TVRO front panel meters are, relatively speaking, quite small. Their scale movement is not intended for **precision** read-out. Even the width of the meter element (the little **pointer** that moves) has a bearing on how accurately you can read the meter; not to speak of problems associated with poorly lighted meter faces and something called 'damped meter movements.'

Some meters have circuits built-in which actually 'slow down' the speed by which the meter pointer moves when the signal changes. To keep the meter from bouncing around everytime a large bird flies in front of the dish, the circuit designer has slowed down the meter's 'response rate.' This of course works **against you** when you try to use



the meter on the front of the receiver for highly accurate readings. There is, simply said, no substitute for a digital reading meter which shows you changes of 1/20th dB or less.

You can prove this to yourself if you are dealing in a receiver which brings out to the (typically) rear apron a set of metering auxiliary jacks; one marked positive (+) and one marked negative (-). Into these

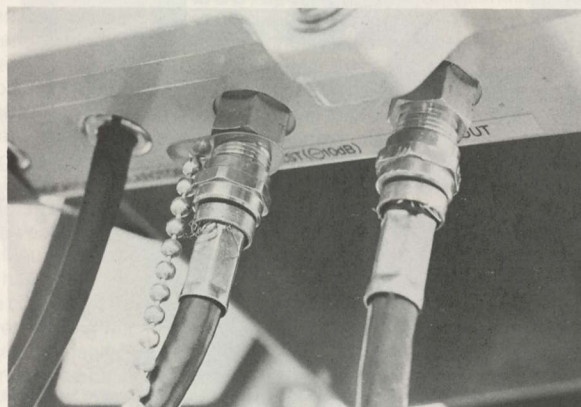
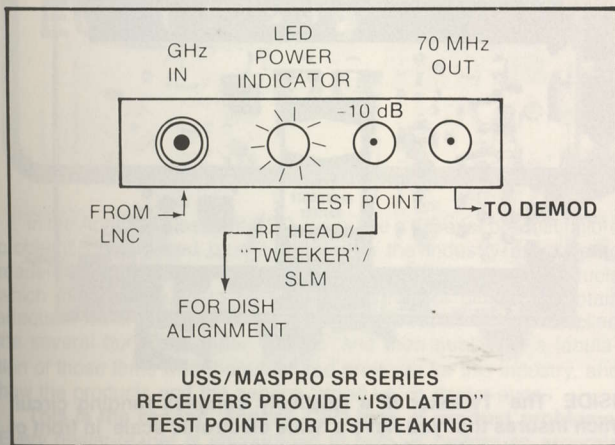
TEST POINTS Helpful

Because all systems must be installed **individually** and peaked and tweaked **individually**, manufacturers are coming to realize that a receive-package which includes such 'dealer-friendly' assists as 'test points' is apt to find favor with 'their customers'; the dealers. **USS/Maspro** has included a ten dB (down) test point for the 70 MHz signal on their down converter since it was first introduced in 1982. What this test point does for you is provide the operational-equivalent of a built-in 'directional coupler,' right at the dish (where the down converter installs) so that all you need to do is plug in an appropriate 'RF head' plus digital multi-meter to set your system for peak performance.

The concept of 'test points' originated in the CATV world more than 30 years ago. Cable line amplifiers, located on telephone poles in outdoor housings, had to be 'monitored and adjusted' by system technicians on a routine basis. Signal level meters were (and remain, today) an important, regular part of the daily routine of the cable operator. By installing the amplifier-mounted 'test-metering-point,' the cable-amplifier manufacturer provided the cable operator with a refer-

ence point at which he could 'verify' the operation of the system without 'breaking into the operating cables' and disrupting service to the cable customers.

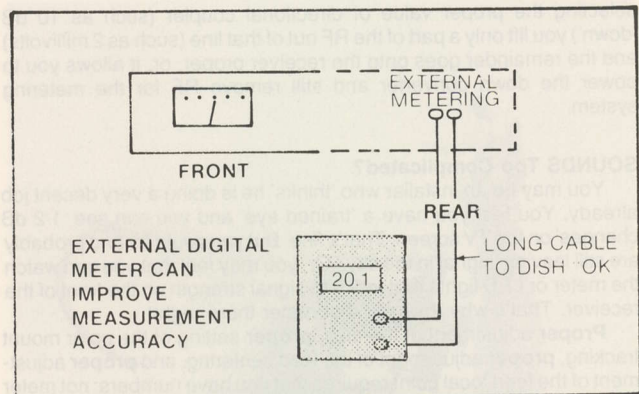
Other TVRO manufacturers who give consideration to this important function include **Clyde Washburn/Earth Terminals (receivers)**. If more dealers insisted on having a test/ metering point available on the equipment they purchase, in no time at all most of the receiver packages (employing a 70 MHz IF) would have it there. The cost to the manufacturer to provide a '10 dB down back-matched and isolated test point' is exceedingly small; the benefits to the TVRO dealer, for initial dish installation as well as routine checks of system performance, are many.



GOOD IDEA/ USS-Maspro SR series receivers has a 10 dB 'down' test point built into the outdoor down conversion package (center jack/cable). You can plug an RF head/multi-meter directly into this test port and monitor signal level while the full system operates without being disturbed.

jacks you can plug or connect the same Radio Shack digital multi-meter described previously, or any other digital multi-meter that has a DC scale on it, and you will quickly see that as you make **very small** changes, you can **see those changes** on the multi-meter far more accurately, and quickly, than you can on the front panel 'analog' type meter with the large pointer.

Once you have convinced yourself of this fact, and if you find yourself without access to an 'RF head' which you can plug in at the down converter, at the dish, you have one other option. If the receiver is temporarily sitting out of doors anyhow because you are doing an install, you can simply plug in your multi-meter at that rear-of-receiver point and use the multi-meter (**rather than** the receiver front panel meter) to do your dish tweeking. Or, you can run a pair of wires (another length of RG-59/U if that is all you have handy, or even 'AC zip cord' from the jacks on the rear of the receiver [inside]) to the antenna where you can see the digital multi-meter.



'THE' Tweaker

Several years ago, the TVRO industry recognized that the problems we have been discussing here were, indeed, very real. That's when a bunch of guys up in Oregon(*) got together and they designed a dish alignment tool which they called, appropriately, 'The Tweaker.' It was (and still is) 'priced right' and it gives the TVRO technician an opportunity to get that last fraction of a dB out of the system if it is used properly.

The Tweaker is a complete test instrument, designed to be 'fed' (connected to) a 70 MHz down converter line. It, like the suggested layout for an 'RF head' and digital multi-meter, goes into a 'cold' 70 MHz line directly (i.e. down converter that does NOT rely on the RG-59/U line for power), or, it goes in with an accessory 'directional coupler' as we discussed here, previously.

The Tweaker is a sophisticated instrument, for its small size and relatively low price. The designers recognized that when you start out with a new installation, you may well be 'well off a bird' with the antenna and they wanted you to have sufficient **system sensitivity**

that you could see some indication of signal long before your stock TVRO receiver was going to be registering even a sync/frame bar. So they made it 'very sensitive.' At the same time, they recognized that as you fine tune the dish system, you are (hopefully) making the signal stronger (and stronger). Ultimately, you would find the 'peak signal' and then you would lock the whole system down; tight.

In between 'a very-very weak' signal, and 'peak signal,' there is quite a range of levels. They had a choice; try to compress that full-range into a single meter scale, or, give you multiple scales to work with. They elected the latter. As you start off with the tuning, you 'open up the meter' sensitivity so that it will react on those very weak signals. Then as you get closer and closer to the peak signal, and the meter reads up higher and higher, it will 'peg' or come to the far right hand side of the scale. That's when you push a button and 'shift scales'; each time you shift from full scale to lower scale you are telling the meter to start all over again at the left hand edge and as the signal gets stronger, the meter needle climbs upwards. This is a pretty nifty idea!

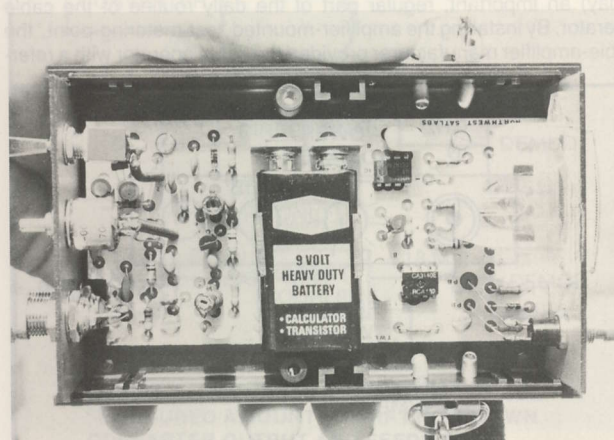
By adopting this 'novel circuit' the Tweaker people have overcome the common problem associated with virtually any of the receiver-built-in analog meters; they have given you a visual scale which **expands itself at the push of a button**, each time you 'run out of meter scale' in a range.

Through the years there have been copies of 'The Tweaker,' and today there are several similar gadgets on the market. Not all offer the push-button ranging, however, and if you are interested in a 'customized' TVRO installer meter, you should keep in mind how the system *must work for you and what you need from the metering system before you buy.*

*) The Tweaker is produced and sold by **Northwest Satlabs**, 806 N.W. 4th Street, Corvallis, Oregon 97330; 503/754-1136.



'THE' Tweaker from Northwest Satlabs was the first customized TVRO installer instrument.



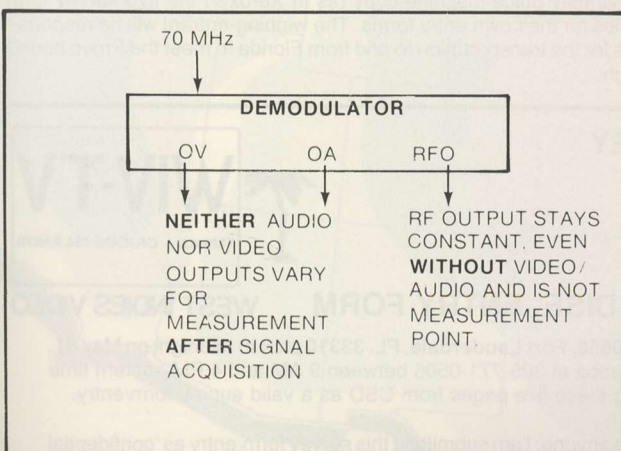
INSIDE 'The' Tweaker is a relatively complex ranging circuit which insures that you have a 'wide electronic scale' in front of you as the signal level increases.

WHAT About Audio/Video?

Some novice installers figure that when the picture is cruddy, they should be able to plug some type of meter into either the **video output** spigot on the back of the receiver, or the audio output spigot. And, when there is no signal there, they will get a 'different reading' than when there is a signal there. Not quite true.

When there is no signal, there is noise. Noise is a randomly distributed phenomenon; it is more like 'AC' than 'DC' and the end result, after the receiver's 'automatic gain control' circuits and IF amplification, is that you get either the same reading, or virtually the same reading with **no signal** as you do **with signal**; or you get no signal when there is no signal, and then a constant signal when there is signal, no matter how strong the input signal may be! Bottom line? You don't want to measure here; not at the audio and not at the video output jacks.

And the RF output, coming out of the TVRO receiver modulator? Shame on you! The modulator has an oscillator built into it. The oscillator **generates or creates** a 'carrier' signal; and you have that 'carrier' present whether you have any TVRO input signal or not! All the TVRO signal does is supply **modulation** to that carrier; and you won't measure that any convenient way, accurately, for dish setting and tweaking.



MOVE the feed up and down (easy to do with a button-hook type of mount; just pull!) and **check the meter for changes in signal. If the signal is better in any direction but at full, neutral, 'rest,' you have a feed centering problem.**

PARTICIPATE/ 1984 INDUSTRY EQUIPMENT SURVEY

In the April 1983 issue of **CSD**, we made a case for product failure problems being faced by the dealers in the industry and offered readers the opportunity to 'file their own comments' about products which they had found to be poorly designed or difficult to obtain adequate factory assistance for getting faults repaired. We compiled the several hundred reader 'entries' and then published a tabulation of those firms who manufactured products for this industry, and how the products and the service 'stood up' in dealer eyes.

This is the second 'annual' CSD look at product problems. Every dealer-reader is encouraged to help us portray an accurate

picture of the 1984 'Status Of Equipment' by completing the four page reporting form appearing here. The results of the survey will be compiled and published in the forthcoming **July issue** of **CSD**.

In the intervening period since our last 'survey' we are pleased to note that many of the manufacturers have instituted 'extended product warranty periods' with some mounts and antenna products now guaranteed against defects in workmanship for periods as long as five years. To the best of our knowledge, there were no such extended product guarantees offered one year ago. At the same time, guarantees on electronic products have also improved measurably and one year full-warranty periods are now quite common. In addition to the original equipment manufacturer warranty programs, there has been an increase in attention to equipment guarantees by equipment distributors. **BR Satellite Communication**, for example, now offers a one-year free-replacement warranty on virtually every product they distribute, with an optional four year extension program. There, clearly, has been a substantial improvement in either product quality, or, the concern of the OEM that the dealer is able to have peace-of-mind when dealing with his supplier. This is in marked contrast to a period when the dealer was experiencing both high failure rates and a long turn around for equipment which did go bad.

Several dealers we talked with, at length, in Las Vegas recently told us that while the general 'trend' is upward, there are still a number of firms selling in the marketplace who seem to have little regard for the dealer. They gave us a list of names for OEMs whom they claimed were either slow to return equipment from repair, or whom they had little respect for as 'equipment designers.' It was suggested that such OEMs actually 'prey upon' the new, novice dealers in the field with an almost deliberate attempt to unload inferior merchandise at what

appears to be 'bargain basement pricing.' One suggested that we should ask dealers, in our survey, how long they have been operating, and then ask them to list the products which each dealer handles. "I think you will find," we were told, "that there is a very definite pattern between years-of-operation and 'brand lines' carried. Those of us who survive for that difficult first year or two must learn the hard, painful and expensive way that certain lines of equipment are simply no good. If we somehow survive that learning curve, we finally settle on certain brands which are backed up by responsible manufacturers. On that foundation, we have been able to grow."

You will find just such a question segment in the survey form appearing here. And we look forward with some anticipation to tabulating the results in this area.

As with our 1983 Survey, each dealer has the right to request that his survey information be 'kept confidential.' If you are worried about responding because you fear that your 'honest statements' might jeopardize a relationship you have with a supplier, fear not. Simply check off the top line on the side-one of the survey form, and everything on that form will be kept in strictest confidence. Your input will be just as valuable to us, however, since the real 'meat' of the survey comes from the tabulated results of the survey. And in that regard, every single dealer input is very important indeed.

DEALER In Paradise

Oh yes, one new twist this year. While we had an excellent survey

response in 1983, we are always interested in finding ways to increase the response. This year we are offering the following as an incentive to complete the form found here:

"On July 1, 1984, CSD will conduct a random drawing using all of the survey forms submitted as an entry base. The drawing will be conducted to randomly select a single entry form from all of those submitted. The winning, randomly-selected survey form entrant will be notified before the 7th of July that he (or she) has won an ALL EXPENSE PAID TRIP for two, for five days, to the Island of Providenciales in the Turks and Caicos Islands. The winner and a companion will be flown from South Florida to Providenciales for a five day period of their choice between 1 December and 1 April (certain holiday-period restrictions will apply) where they will be hosted by Bob Cooper. All hotel accommodations and meals plus a rental vehicle will be supplied on Providenciales (Provo) and the winner and companion will have the opportunity to enjoy the fantastic 'winter weather' of Provo as well as tour and enjoy the island, and the extensive satellite communication facilities located there."

Your five-sided Dealer Survey Entry Form must be postmarked no later than **midnight, May 31st, 1984** to qualify for the July 1st drawing. Only one 'entry' per dealership. Dealers not subscribing to CSD may office-machine-copy (as in Xerox®) the five survey form sides for their own entry forms. The winning-entrant will be responsible for the transportation to and from Florida to meet the Provo bound flight.

1984 OFFICIAL CSD DEALER/PRODUCT SURVEY and



'DEALER IN PARADISE' ENTRY FORM WEST INDIES VIDEO

Instructions: Complete sides one to five and postmark to CSD, P.O. Box 100858, Fort Lauderdale, FL. 33310 prior to midnight on May 31, 1984. If you have any questions about completion of the form, call Carol Graba at 305-771-0505 between 9 AM and 4 PM eastern time Monday-Friday. You may office-machine-copy this form in lieu of removing these five pages from CSD as a valid survey form/entry.

____ **PLEASE do not quote** any of the information contained in this form to anyone; I am submitting this survey form/entry as 'confidential material' to be used in compiling the industry data base only (check only if applies).

YOUR NAME _____

COMPANY/Dealership Name _____

Mailing Address _____

Town/City _____ State _____ Zip _____

Telephone Number _____ Years/Months selling TVROs _____ years _____ mos.

A) We _____ did _____ did **NOT attend** either of the Las Vegas shows in March.

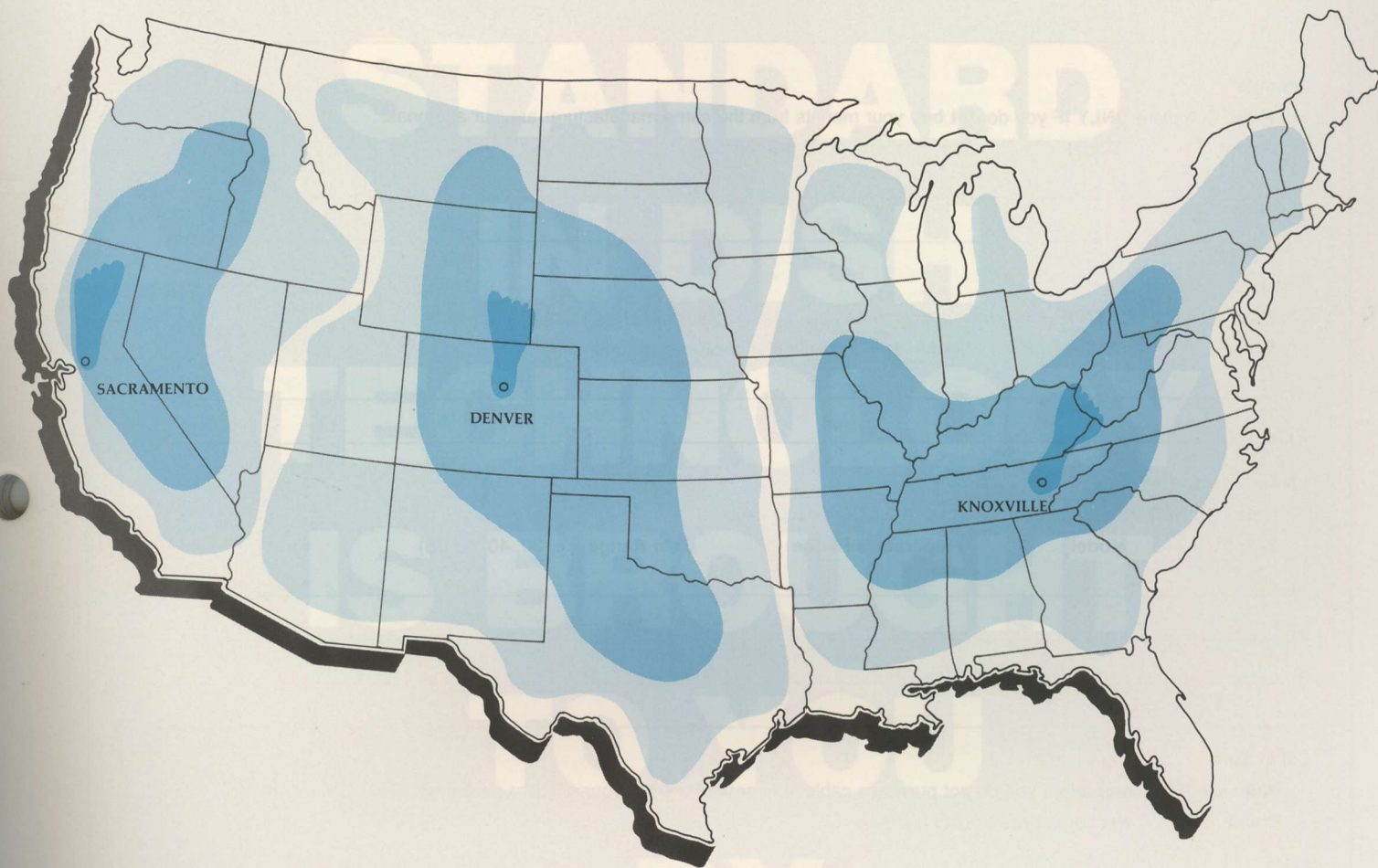
B) We **plan** to attend _____ STTI show in Niagara Falls in June _____ SPACE show August/September _____ STTI show in Nashville Labor Day weekend.

—TURN TO PAGE 18—

SOMEBODY COMPLETING THIS FORM will win an
expense paid trip for **TWO** people to Providenciales
in the Turks and Caicos Islands; **it could be you!**

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To order call:

800-521-9282 (NATIONAL)



10536 LEXINGTON DR.
KNOXVILLE, TN 37922
(615) 966-4114

To order call:

800-223-1507 (EASTERN ZONE)

DEALER IN PARADISE/side two

PRODUCT LINES CURRENTLY CARRIED for re-sale:

Antennas

Brand	Model	Size
1) _____		
2) _____		
3) _____		

Mounts

Note: Complete **ONLY IF** you do **not buy** your mounts from the same manufacturer as your antennas.

Brand	Model	For Use with (antenna model)
1) _____		
2) _____		

Feeds

Note: Complete **EVEN IF** your antennas come complete with a feed packed with the dish antenna.

Brand	Model	Check Here if you buy separate from antennas
1) _____		
2) _____		

LNAs

Note: Do **NOT complete** if you use LNB or LNC products ONLY.

Brand	Model	Temperature Range	Gain Range (i.e. 30, 40, 50 dB)
1) _____			
2) _____			
3) _____			
4) _____			

Cable Sets

Note: Do **NOT complete** if you do not purchase cable sets **separate from** your receiver packages.

Brand	Package Type (model number)
1) _____	
2) _____	

Actuators

Brand	Model	Approximate Number Used To Date
1) _____		
2) _____		

Receivers

Note: Please clearly mark those that have LNB or LNC design; and, built-in modulator.

Brand	Model Number	Has LNB	Has LNC	Has Built-In Modulator
1) _____				
2) _____				
3) _____				

**THE NEW
STANDARD
IN DISH
TECHNOLOGY
IS BROUGHT
TO YOU
BY
WINEGARD®**

PERFORATED PERFECTION

NOW, A CLEARLY SUPERIOR SEE-THROUGH DISH

Make the break from mesh to a higher quality see-through dish. Take a look at Winegard's perforated aluminum 10-footer. There's nothing else like it on the market.

Winegard's new dish has a sharp, clean look of quality. It's a new level of dish technology offering advantages other see-through dishes can't deliver. Like 39.5db gain, F/D "Deep Dish" ratio of 0.283, lightweight yet rugged construction, super-simple assembly, anodized protection, high performance and a look of class that your customers will appreciate. What more could you ask for?

A TRUE PARABOLA

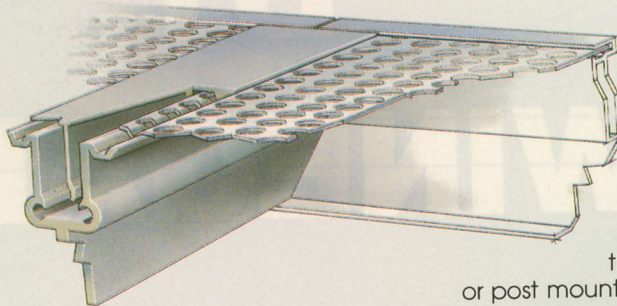
The ultimate goal in designing a satellite dish is to create a reflector that is a "true parabola" - providing "near-perfect" efficiency.

Winegard engineers have developed the truest parabolic dish of any of the see-through category. Each petal, rib and outer ring is stretched-formed to a parabolic shape with specs so tight it took months to perfect the process.

Our exclusive extruded rib and locking system has simplified assembly, eliminating the need for hundreds of bolts, nuts, washers and fasteners. Every time you attach a bolt, screw or fastener to a dish you add another stress point, distorting the shape. With Winegard's extruded rib and locking system, the stress is uniform across the dish, maintaining its true parabolic shape and integrity.

WHY SPEND HOURS ASSEMBLING AN ANTENNA WHEN YOU CAN DO IT IN MINUTES?

Winegard's 10-foot perforated dish is shipped in four quarters. Total weight is only 92 pounds. It's easy to handle and transport. All that's required for finished assembly is fastening the main ribs together with 16 stainless steel nuts & bolts; placing four tension-straps into the outer rim; and securing with 8 screws. Just a 20 to 30 minute job for two people.



LIGHTWEIGHT BUT RIGID PERFORATED ALUMINUM

Not only is the Winegard perforated aluminum dish lightweight and easy to handle, but it is extremely rugged, durable and well constructed. You can actually see through the perforated petals which are constructed of .040-gauge anodized aluminum. The extruded aluminum main ribs, which provide the basic structural support, are 1/8" thick. The locking ribs are .070" thick and lock the perforated aluminum petals tightly in place. A double-walled outer rim provides an area to insert tension straps at all joints for perfect alignment and additional strength.

Wind-loading capabilities are outstanding with a wind survival rate of 125 mph. And, because the perforation eliminates 36% of the surface area and the anodized surface is pre-etched, the dish reflects very little heat into the feedhorn, keeping the noise temperature of the LNA down.

ANODIZING. . . THE ONLY TRUE WEATHER PROTECTION

Winegard revolutionized the outdoor antenna industry years ago with the introduction of anodized aluminum elements - now we bring this process to the satellite industry. The anodizing process actually penetrates the aluminum with a protective coating that resists rust and corrosion, virtually tripling the life of the aluminum. It's the only permanent protection against adverse weather and ideal for coastal (salt spray) areas.

FOUR COMPLETE 10-FOOT SATELLITE TV PACKAGES

Winegard offers four complete 10-foot perforated satellite systems that include antenna, pedestal or post mount, back-up structure, Polarotor I, 24-channel receiver, LNA, wire and a choice of motorized or non-motorized.

Winegard perforated . . . a new standard of excellence.

THE EXTRA EDGE!

WINEGARD'S NEW 100° LOW NOISE AMPLIFIER

Four GaAsFETs are utilized in the state-of-the-art circuitry designed to meet the rigorous requirements of 90% of all home TVRO installations. Performance and reliability as good as the best! Circuit is fully protected from reverse polarity voltage, surge voltage and lightning.

Model SC-8101 combines extremely low noise figures with low input and output and the gain slope/group delay characteristics vital to TVRO performance. Each LNA is factory-tested for noise figure, noise temperature and gain, and the test results are packed with each unit. Gain figure exceeds 50dB.

SO PUT OUR LNA TO THE TEST

Try the Winegard SC-8101 on your next installation and compare it with any other 100° LNA on the market.

We guarantee you'll be impressed.

Write for detailed literature.



THE WINEGARD
CHROMSTAR "10"
MODEL SC-1018*



© 1984

*U.S. Patent Pending

WINEGARD®
SATELLITE SYSTEMS



DEALER IN PARADISE/side three

Modulators

Note: Do **NOT** complete if you only use a receiver line(s) with built-in modulators.

Brand	Model Number	Typical Operating Channel
1) _____	_____	_____
2) _____	_____	_____

Stereo Processors

Note: Complete **ONLY FOR** stand-alone stereo processors you sell; receivers with built-in stereo processing are not to be listed here.

Brand	Model Number
1) _____	_____
2) _____	_____

ABOUT YOUR OPERATION:

1) Total number of home TVRO systems **sold** in period May 01, 1983 to April 30, 1984

2) Total number of home TVRO systems **sold** in period April 01, 1984 to April 30, 1984

3) Total number of home TVRO systems you **expect to sell** between May 1 and May 31, 1984

4) **Average retail price** you expect to receive for those terminals sold between May 1 and May 31, 1984: \$ _____

5) Describe (by model number) the 'typical' system you sell, showing each component from feed/antenna through to modulator (if used):

6) This package will retail to your customers for \$ _____

7) Your own best estimate of how much (a percentage) you expect 1984 business to be **UP** from 1983 business for your dealership:

_____ %

8) Your business is:

_____ 1) a corporation _____ 2) a partnership _____ 3) proprietorship

9) Your Operation:

1) We have _____ FULL TIME employees (if none, put 0)

2) We have _____ vehicles dedicated to TVRO sales/installation work (vehicles you would NOT own/use if you were not selling TVRO systems)

3) We _____ **DO** _____ **DO NOT** maintain a shop/storefront operation with REGULAR, posted business hours and someone to answer the telephone during those regular hours.

4) We project that for calendar year 1984 we will sell IN THE TVRO PRODUCT AREA \$ _____ in retail sales.

5) We operate our business as a _____ stand alone TVRO sales and service center; _____ in conjunction with other retailing activities.

A) If you have other retail activities, please list the general type of activity.

6) We _____ use direct mail advertising _____ use local newspaper advertising _____ use yellow page advertising _____ use local radio advertising _____ use local television advertising.

7) We _____ **DO** _____ **do NOT** use dedicated sales people who do nothing but sales.

8) We _____ Exhibit _____ **do NOT** Exhibit at local fairs, consumer shows.

9) We _____ do have at least one trailer-mounted antenna _____ **do NOT** have a trailer mounted antenna.

A) If you **do have** a trailer mounted antenna:

1) Brand of antenna and size _____

DEALER IN PARADISE/ side four

- 2) _____ We use it for site testing and sales demos
- 3) _____ We use it for downlinking jobs
 - A) During 1984 we expect to do _____ down linking jobs.
- 10) We service an area that has a radius (distance around you that you routinely cater to) of _____ miles.
- 11) Within our 'service area' (as just defined) there are approximately _____ other firms selling TVRO systems.
- 12) Do _____ do **NOT** _____ belong to SPACE.
 - A) If **DO NOT** belong to SPACE: _____
 - _____ We **WOULD** join SPACE IF: _____

YOUR FEELINGS ABOUT EQUIPMENT

Note: All of this information is confidential and material extracted from your form will **NOT** be credited to you under **ANY** circumstances.

Antennas:

- 1) Antenna models you feel are superior (brand, model) _____
- 2) Antenna models you feel are inferior (brand, model) _____
- 3) Antenna models you once used and will NEVER carry again because of problems: _____

Feeds:

- 1) Feed models you feel are superior (brand, model) _____
- 2) Feed models you feel are inferior (brand, model) _____
- 3) Feed models you once used and will NEVER carry again because of problems: _____

LNAs:

- 1) LNA models you feel are superior (brand, model) _____
- 2) LNA models you feel are inferior (brand, model) _____
- 3) LNA models you once used and will NEVER carry again because of problems: _____

Receivers:

- 1) Receiver models you feel are superior IN THEIR **PRICE CLASS** (brand, model) _____
- 2) Receiver models you feel are inferior IN THEIR **PRICE CLASS** (brand, model) _____
- 3) Receiver models you once used and will NEVER carry again because of problems: _____

SOMEBODY will win ; it could be you!

M/A-COM introduces T-1 and H-1, the satellite receivers that deliver studio quality.

The system makes the picture, and our new receivers are an important part of the M/A-COM system.

M/A-COM receivers have microprocessor controls. When it comes to programming and tuning, the first time is the last time. No need to repeat the process every time a receiver is turned on. And in the event of a power failure, there's microprocessor memory retention.

Other M/A-COM receiver features include:

- Parental supervision channel lock-out.
- A single IR remote control for T-1, H-1 and for the new M/A-COM antenna positioner.
- Acceptance of both mechanical and electronic polarization controls.
- Programmable audio, with up to 72 audio memories on the H-1.

■ Dynamic Noise Reduction on the H-1 receiver; Dolby on the T-1.

■ User-friendly, attractive design.

In addition, M/A-COM's use of high quality block down conversion permits each receiver to have independent channel selection when multiple television sets are used in the same home.

M/A-COM Cable Home Group, Marketing and Sales,
P.O. Box 1729, Hickory, NC 28603 800/438-3331
704/324-2200 Telex: 802-166

M/A-COM

CABLE HOME GROUP



*The system makes the picture.
M/A-COM makes the system.*

DEALER IN PARADISE/side five (end)

Actuators/Controllers:

- 1) Actuator/controller/drives you feel are superior (brand, model) _____
- 2) Actuator/controller/drives you feel are inferior (brand, model) _____
- 3) Actuator/controller/drives you will NEVER carry again because of problems: _____
- 4) We look to _____ our distributor _____ the OEM for warranty/repair/equipment replacement.
- 5) We feel the warranty/repair/replacement 'problem' _____ is **no better** than a year ago, _____ **some better** than one year ago, _____ **much better** than one year ago.
- 6) The **best** warranty/repair/return/replacement service we receive comes from: _____
- 7) The **worst** warranty/repair/return/replacement service we receive comes from: _____
- 8) We buy:
 - _____ direct from the original equipment manufacturer/importer (name of your largest supplier) _____
 - _____ from a distributor (name of your primary distributor-supplier) _____
- 9) We _____ do _____ do **NOT** offer financing for systems sold.
 - A) If you **DO** offer financing, do you use:
 - _____ Local bank(s) _____ Local finance company _____ SFPC _____ Other (detail) _____
 - B) Financing presently accounts for _____ % of our total system sales in system volume.
- 10) We give our customers:
 - _____ 90 day complete guarantee _____ 180 day complete guarantee _____ 12 month complete guarantee
- 11) We offer our customers additional warranty/insurance protection for:
 - _____ 1 year at a time _____ 3 years at a time _____ 5 years at a time
- 12) We _____ do _____ do **NOT** have any communities in our area with anti-TVRO zoning. (If do, please list communities): _____
- 13) The TWO biggest problems facing our industry today are:
 - A) _____
 - B) _____

YOU may machine-copy all five sides rather than taking your CSD apart!

**DEADLINE TO ENTER
TO WIN A TRIP FOR
TWO to PROVO IS
MAY 31st!**

Details page 16 this issue!

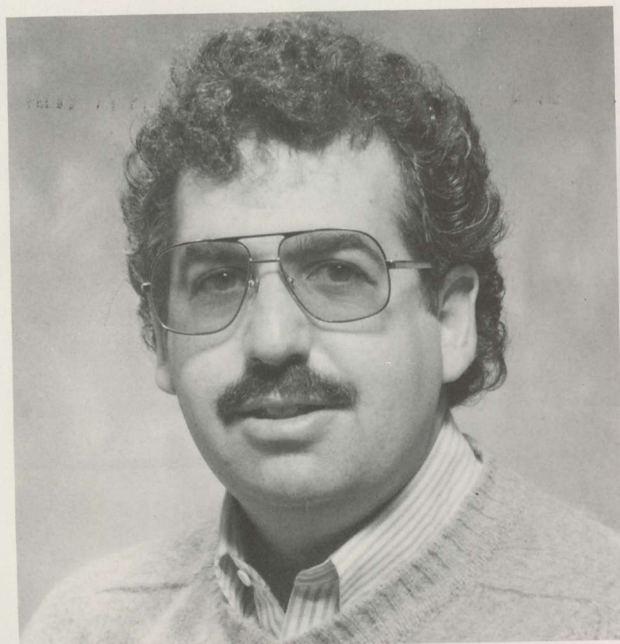
CANADA THREATENS

In the January edition of **CSD**, we told you how a Federal Court Trial Judge had sent shock waves reverberating through the cable-tv pay-tv and broadcasting industry, and how even the regulators had recoiled in horror when they read the judgement in the Lount case. In that case, Mr. Justice Muldoon declared that an SMATV system operating at the Holiday Inn in Winnipeg, Manitoba, was not a broadcasting undertaking subject to CRTC regulation (although it was carrying Home Box Office, Showtime, and WTBS).

We predicted that the Canadian Government would move quickly to appeal that judgement. **They did.** We also predicted that there would be some attempt made to amend the law. **They are attempting to amend the law.**

In mid-February the Minister of Communications, Francis Fox introduced Bill C-20 into the Canadian Parliament. C-20 is an "omnibus" communications bill. In other words, it tries to tidy up a lot of existing gaps and holes in the communications laws, make some changes to the way in which Bell Telephone is regulated, change some of the structure of the CBC, and most important to the TVRO

by,
Mark L. Lewis, Esq.
717 Parkdale Avenue
Ottawa, Ontario
K1Y 1J5, Canada



NEW CRACK DOWN ON SMATV

industry, it attempts to plug the gap which Justice Muldoon created when he pronounced his famous judgement.

The amendment is relatively straight forward. It reads:
"16. Section 2 of the Broadcasting Act is amended by adding thereto the following subsection:

(2) For the purposes of this Act, any person who within Canada or on a ship or aircraft registered in Canada transmits or **distributes by means of telecommunication, otherwise than solely as a telecommunication common carrier and whether or not for any consideration, any programming received by radiocommunication is deemed to be a carrying on a broadcasting undertaking.**"

The wording would have the following effect. **First**, the wording "distributes by means of telecommunication" would cover all methods of distributing signals, via MDS, VHF, UHF, fibre optics, and, by means of wire.

Secondly, "whether or not for consideration" **would cover** the situation where the operator of the SMATV or TVRO does **not charge** for the provision of service. In Canada 99.9% (maybe 100%) of SMATV operators are **not paying** for service to the originators, and most are **not charging** tenants or guests for the SMATV service. In the Lount case, Mr. Justice Muldoon argued that there had to be some sort of charge for service in order to establish that the hotel had been operating a "broadcasting undertaking." Under the revised law, just operating a TVRO would be enough for a court to find that there was a "broadcasting undertaking."

Thirdly, if you distribute **any programming** received by radiocommunication, you get caught by the definition. In other words, it will no longer matter whether your TVRO receives HBO (which HBO contends is a private point-to-point communication), or whether you receive WOR, which at one stage in its transmission **WAS** a broadcast signal emanating from a VHF transmitter in Manhattan. As long as you distribute programming ("visual images or sound matter designed to inform, enlighten or entertain"), which is received by telecommunications, you are involved in operating a broadcasting undertaking.

What will this mean to the TVRO and SMATV industry? For the SMATV industry, the "free lunch" is over. While U.S. groups like SPACE have tried to negotiate for SMATV rights, and in many cases succeeded, the Canadian TVRO industry has **largely** gone ahead and swiped HBO etc., and told apartment owners, and motel owners **"don't worry, we're in Canada; they (HBO etc.) can't get you."**

Now before everyone loses their temper, and think that I'm branding all SMATV operators in Canada as "pirates," wait a moment! There are **some** SMATV operators or TVRO owners who have tried to obtain programme rights. (I have written permission to listen to KKKO Los Angeles on the subcarrier of F4 TR-17).

Of course, HBO (etc.) has argued over the years that their copyrights do not allow them to sell their services in Canada. That argument sometimes includes reference to the nefarious Intelsat Agreement and "Canada-U.S. Letters of Agreement on Transborder Satellite Service" which can or cannot permit transborder satellite reception depending on the day of the week and bureaucrat in Washington or

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- * Tunable Audio with wide and narrow IF switch
- * Comprehensive Remote Control (Standard with COM-2A, Optional with COM-2B)
- * Remote Downconverter
- * Sensitive Signal Strength Meter
- * AVCOM Quality at a Low Cost



COM-2A

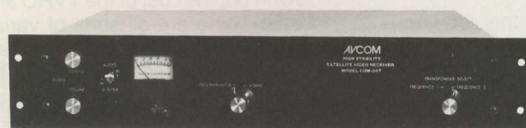


COM-2B



SCPC-100

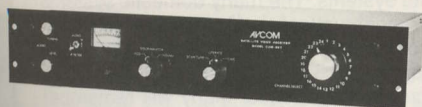
AVCOM's SCPC-100 allows reception of single channel per carrier transmissions from international and domestic satellites. Audio channels not sent with video information can be received. Features external or internal downconverter.



COM-20T

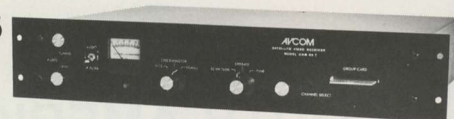
AVCOM's COM-20T High Stability Satellite Video Receiver is the answer to your need for a highly stable and reliable receiver for cable, private cable, radio stations, TV stations, BIZNET, News, Weather & Music Services, and other dedicated applications. The COM-20T can be factory or field adjusted to a particular transponder and will

remain on frequency without attention. The COM-20T is normally supplied with a remote downconverter and tunable audio. Optional configurations include fixed-tuned audio, internal downconverter, and downconverter switching for multi-channel capability. Styling matches AVCOM's popular series of rack mount receivers.



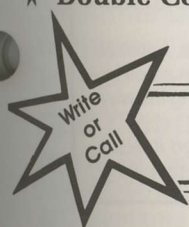
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COM-65T

- * Commercial Quality
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- * Rack Mount, standard
- * Double Conversion
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- * High Stability



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Ottawa with whom you speak.

Now before everyone jumps on me for singling out the TVRO and SMATV industry, this issue is **not limited** to TVRO manufacturers, installers or SMATV and TVRO owners; there are plenty of **cable operators** supplying HBO or Showtime, or Disney to **paying subscribers**; some of them outright refuse to buy the "legal" Canadian pay-tv services. Lots of these people have never bothered to pick up the telephone to try and purchase the rights. One cable operator whom we know of in British Columbia has the chutzpah to charge subscribers \$17 for a package of channels which would only cost \$9.95 in the U.S., then he "steals" HBO and **scrambles it** and sells it for an additional \$11 and **pockets all the money!!!** If he paid HBO for the service, he would have to fork over at least \$6 (Canadian) of that \$11 (of course First Choice and Superchannel, the holders of the movie rights get zilch from these cable systems). There are enough of these cable operators doing this to warrant special attention from the CRTC, Department of Communications, and, Department of Justice.

Simply stated, there is an undeclared war starting in Canada on SMATV and cable operators who are distributing foreign satellite signals without authority. One civil suit was launched in mid-February against an SMATV operator, by a cable system, over the rights to use wiring in a building. Other lawsuits are pending. Most of these lawsuits will **not depend** on the amendments to the Broadcasting Act (C-20).

Undoubtedly, people will say that Bill C-20 goes too far, declaring SMATV, and private TVROs to be "broadcasting undertakings" and thereby subject to licensing and regulation. In fact most of the Canadian TVRO industry probably hasn't even bothered to read C-20, but it is clear to me that TVROs **would be subject to** licensing (and possibly prohibition) **if** the Federal Authorities reversed their stand of March 1983. We all know that in the **real world** it is too late to control private TVROs, but C-20 is no laughing matter when it comes to SMATV in condominiums, or motels, or apartments.

Before I paint all too bleak a picture, remember that the CRTC announced that its SMATV **would allow** operation of TVROs in some cases, but there are some CATCH-22s involved. The SMATV system would have to offer all Canadian channels offered by the local Canadian Cable licensee, (including French language channels which are unpopular in most parts of the country). SMATV operators would be limited to U.S. satellite services **authorized for cable**. **At the present time, that means no U.S. services** but that may change in 1984, because the CRTC **will** allow some importation of U.S. specialty services. The actual services are yet unknown but you can almost wager that they will **not include** WTBS, WOR, WGN, HBO, SHOWTIME, TMC, ESPN, MTV. Right now, ESPN rights have been sold to First Choice pay-tv which began carrying about 14 hours/week of ESPN in March. If the CRTC licenses domestic versions of MTV and a sports network (decision expected momentarily), they would also **not allow** wholesale importation of a music TV or all sports U.S. service.

What is SMATV left with? Not very much. Perhaps The Weather Channel, perhaps CNN & CNN2, Nashville Network, Rev. Gene Scott, but that is about all. Most other U.S. services would too closely resemble conventional broadcasting according to the existing CRTC policies.

In summary, SMATV faces some incredible hurdles. The question is **whether C-SPACE is up to the challenge**. Will a Canadian industry made up of individuals who largely mistrust each other, lobby on Parliament Hill and other places to soften the blow? **Will vendors** of equipment advise their SMATV clients of the copyrights issues? I don't have any of the answers, but time is short if the SMATV industry in Canada wants to ensure its survival.

There is one aspect which I saved for last: As predicted in the January article, the Prime Minister has resigned, pending election of a new leader in a national convention. That means that there will likely be an election this fall. That also means that there **may be** a change of government or a change of Communications ministers. Whether Bill C-20 can get through the House of Commons for passage **before** the new leader is elected, and before the election, is open to some doubt. C-20 may become stalled as party politics over-ride the business of the nation. But there was an attempt at getting an 'all party' agreement from the opposition parties to rush C-20 through in this session. **If the TVRO/SMATV industry** has something to say to law-makers, **they had better hurry!**

While on the topic of "piracy," there is another dimension to the problem which threatens to hurt the entire Canadian TVRO industry. In dozens of towns across Canada, community groups and entrepreneurs operate TVROs with VHF or UHF rebroadcasting transmitters. In some towns, they solicit funds (about \$200) per household, which provides HBO or TMC and WTBS or WGN in perpetuity. **Some towns** put the cost of the TVRO and maintenance **onto the local tax base!** There are all sorts of variations and combinations. In some instances, licensed cable operators or broadcasters have been harmed and in some instances there is RF interference. All have complained to federal authorities, and their politicians. It is the wrath of all of these parties which may harm the overall TVRO industry, because of the dozens of over-the-air rebroadcasts. Basically, having your own home TVRO is O.K., **and that will not change**, but if anyone wonders about the potential of "overkill" which is about to occur and the wrath which may reign down, just remember, someone, somewhere sold these dozens of TVROs which are being used as rebroadcasting stations.

When you travel across America you see a lot fewer blatant instances where HBO etc., are being rebroadcast. It simply isn't tolerated in America. There **are** ground rules. **Perhaps** it is the **Canadian situation** which is spurring the rush to scramble in 1984, more than anything else.

SOUTH AMERICAN DOMESTIC BIRDS

by
Elio Sion

Space and Communications Group
Hughes Aircraft Company
El Segundo, CA 90009

Ever since the era of satellite communications began, Latin America has been one of the most active regions in the world in implementing domestic satellite systems. The many domestic systems in operation today in Latin America attest to this observation.

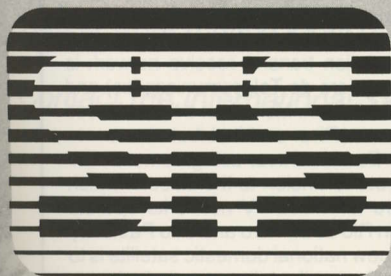
By the early 1970's, most Latin American countries either had installed an Intelsat station or had access to one. The transition to the new technology at times created paradoxes. Many will remember when in that part of the world it was faster to call New York or London than a city 20 or 30 kilometers away. Even today, in most large countries some isolated regions are difficult or impossible to reach because a communications system has not yet been installed there.

This paradox was very effective in demonstrating the "instant" benefits of satellite communications. Administrations seeing the slow development of communications via terrestrial means in their countries quickly took the first step toward national domestic satellite systems.

The logical and economical way was to grow into a national system by first leasing transponder capacity on an Intelsat satellite. And this was precisely the approach taken, with Brazil leading the way in 1974.

As a preliminary to a national system, the use of leased Intelsat transponder capacity has numerous advantages for nations preparing

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to implement a national domestic system of their own. For cash-limited nations, the initial investment is relatively small because it involves only the purchase of a few earth stations and the appropriate lease of transponder capacity at \$0.8 million per year (in U.S. dollars) for preemptible global beam transponder service. Consequently, an administration need not concern itself at the outset with the costs (satellites, TT&C stations, training and staffing of personnel) and the efforts associated with a space segment. Instead, it can devote its energies to building earth stations and integrating them into the terrestrial network.

A disadvantage of leased Intelsat service is that, in general, Intelsat satellite power levels are significantly lower than those achieved with a domestic system. Consequently, domestic earth station antennas sized for Intelsat power levels are considerably larger and therefore more expensive than those used for national domestic systems. And, those earth stations destined for rural communications become oversized when the administration buys its own national satellite.

However, the flexibility and the low initial cash requirements of a domestic system based on INTELSAT leases well offset the cost of overbuilt and overpriced earth stations procured in the initial stages of system buildup — provided the transition to an optimized national domestic system does not lag too far behind. For example, Brazil, which initiated service in 1974, now has a complement of 65 (10 m) earth stations, with 18 more planned for installation by the time that its domestic satellite, SBTS (Sistema Brasileiro de Telecomunicações por Satellite), is launched in February 1985. These additional 18 stations sized for the more powerful national domestic satellite, SBTS, use only 6 m antennas. Eventually the Brazilian earth complement is to include several thousand of these smaller earth stations. In this overall perspective, the initial overexpenditure for larger, 10 m earth stations has only a small impact on the total cost.

However, there are some factors to weigh in considering INTELSAT leases: 1) the desired transponder capacity may not always be available for lease when needed; 2) the low transponder lease cost of \$U.S. 0.8 million per year is for a preemptible transponder. Therefore, any time INTELSAT needs the transponder for guaranteed (backup)

services, the leased service can be interrupted (although preemption has not been required to date). 3) Growth or extra leased transponder capacity at equally low lease costs cannot be guaranteed.

Table 1 shows the status of domestic satellite systems in Latin America. A description of the various Latin American domestic systems follows.

BRAZIL

Brazil was the first Latin American country to establish a domestic satellite system. In July 1974, coverage of the World Cup games was transmitted from Tangua to Manaus and Cuiaba via a leased Intelsat transponder. Brazil is also the first Latin American country to have procured its own national domestic satellite: a Hughes type HS 376 satellite from Spar Aerospace of Canada. Two satellites are scheduled for launch in February 1985 and August/September 1985 respectively.

Today Brazil has a domestic satellite terrestrial network consisting of one master station (15 m), 20 transmit-receive (10 m) stations, and 37 TV receive-only stations. The 20 station transmit-receive network is operated by Embratel (Empresa Brasileira de Telecomunicações) and provides telephony as well as TV distribution. More than a third of these stations are located along the Amazon River and its tributaries.

Two TV networks, Globo and Bandeirantes, using some 44 TV receive-only earth stations, distribute television to the cities in which they are located. The transmitters for these TV networks operate through Embratel's earth stations in Rio de Janeiro and Sao Paulo. By the end of 1985, or before Brazil's new national domestic satellite is to be launched, 18 more transmit-receive earth stations are to be installed by Embratel.

Brazil's domestic satellite, **SBTS** (Sistema Brasileiro de Telecomunicações por Satellite), is presently under construction. The satellite is a 24 channel, C band, Hughes HS 376 type of satellite being built by Spar of Canada under license to Hughes. (See **Table 2** for the satellite's characteristics and map for its coverage pattern.) Hughes is also participating in the construction as a subcontractor to Spar. A TT&C station to operate the SBTS satellites is also under construction

TABLE 1. DOMESTIC SATELLITE SYSTEMS IN LATIN AMERICA
Earth Stations Installed

Country	Transmit-Receive	Receive Only	Planned Earth Station Installations By End of 1985	Intelsat Transponder Leases	Services Provided	National/Domestic Satellite
Argentina	1 (13 m) 30 (11 m) 2 (11 m) mobile 3 (6.1 m) transportable		3 (11 m)	1½ Global ⁽⁴⁾	Telephony/ DAMA 1 TV 1 Radio	International tender for satellites in preparation
Brazil	1 (15 m) 20 (10 m)	44 (10 m)	18 (6 m)	6 Hemispheric ⁽¹⁾ 1 Global	Telephony +2 TV	2 Hughes type HS 376 24 channel C band under construction by Spar of Canada 2 Ariane launches 1985
Chile	3 (11 m)		3 (11 m)	½ Global ⁽⁵⁾	Telephony	
Colombia	3 (13 m) 14 (11 m)		5 (7.5 m) 2 (13 m)	½ Global ⁽⁴⁾ ½ Hemispheric	Telephony +TV	SATCOL satellite project under study
Mexico	7 (11 m) 2 mobiles	12 (11m) 23 (7.5 m) 113 (7.0 m) 14 (5 m) 5 (4.5 m) 2 transportable	24 (7.5 m) 86 (7 m)	3 Spot ⁽²⁾ 1 Westar/Galaxy ⁽³⁾	4 TV + Telephony	2 type HS 376 under construction by Hughes 18 channels at C band 4 channels at K band 2 STS launches 1985
Peru	3 (11 m)	3 (6 m)		1¼ Hemispheric ⁽⁴⁾	Telephony +TV	
Venezuela	1 (11 m)	1 (9 m) 2 (7 m)	21 (7 m)	1 Hemispheric ⁽⁴⁾	1 TV	

(1) Intelsat IV-A, F-2, built by Hughes and launched January 1976.

(2) Intelsat IV, F-1, built by Hughes and launched May 1975.

(3) Western Union's Westar 4, HS 376, built by Hughes and launched February 1982.

Galaxy 1, Hughes Communications-operated HS 376, built by Hughes and launched June 1983.

(4) Intelsat V, F-4, built by FACC and launched March 1982.

(5) Intelsat IV-A, CF-1, built by Hughes and launched September 1975.

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in Guaratiba near Rio de Janeiro.

For the past six years, Avibras, a Brazilian company, has built the antennas for the earth stations. Embratel has built the earth stations in Brazil, importing only certain subsystems, such as transmitters, LNAs, and other components built by Hughes and other suppliers.

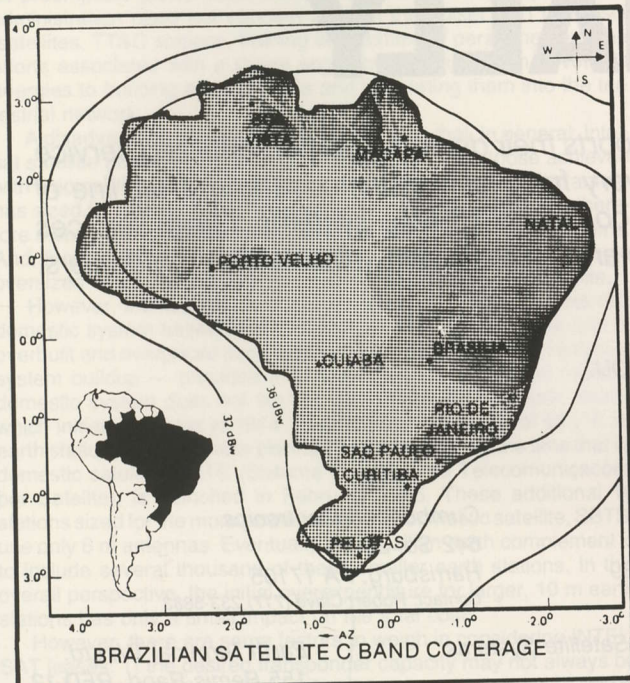


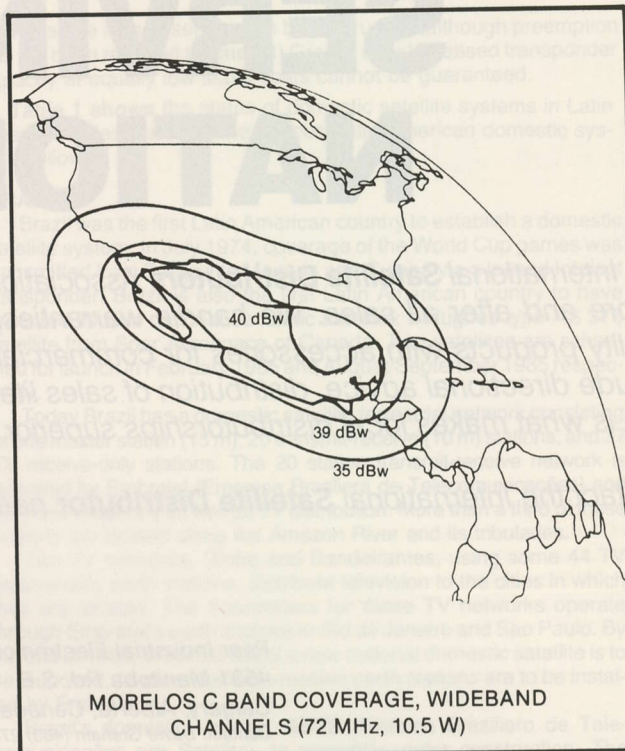
TABLE 2. BRAZILIAN SATELLITE CHARACTERISTICS

Characteristic	Name or Value
Transponders	24 at 36 MHz (+6 spares) 10 W power 4/6 GHz
Type of spacecraft and manufacturer	Hughes HS 376, Spar (2 spacecraft program)
Design life (fuel-dependent)	8 years
Launch vehicle	Ariane
Launch dates	February 1985, August 1985
Orbital locations	60°W to 70°W
Operator	Embratel (Empresa Brasileira de Telecomunicações)

MEXICO

Mexico's domestic satellite system is the most extensive in Latin America and ranks among the largest in the world. Service was inaugurated via leased Intelsat transponders on May 1, 1980. **Morelos**, Mexico's new domestic satellite system, is named after Jose Maria de Morelos y Pavon, "Servant of the People and one of the Liberators of Mexico." Two Morelos satellites are being constructed by Hughes in El Segundo, California. Morelos is a Hughes HS 376 hybrid (C and K band) satellite, which will be launched on the shuttle in May and September 1985. A TT&C station is also being built by Hughes in Mexico City.

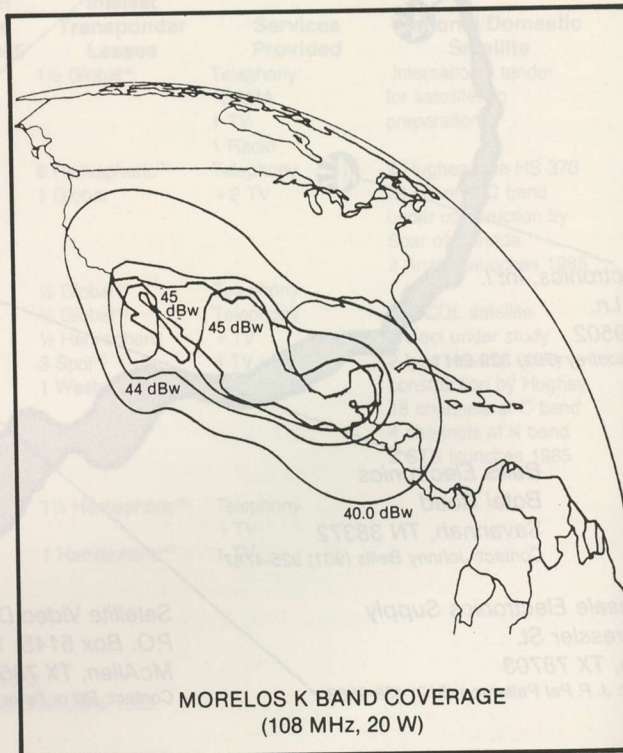
Today, Mexico's terrestrial network includes 174 earth stations. Two of these are trailer-mounted mobiles, and two are transportable earth stations. In addition to the two mobiles, seven of the total installed earth stations are transmit stations: four in Mexico City, one in Tijuana, one in Cancun, and one in Tulancingo. All others are TV receive-only stations, which, however, have been designed for easy conversion into transmit-receive stations to provide telephony services.



MORELOS C BAND COVERAGE, WIDEBAND CHANNELS (72 MHz, 10.5 W)

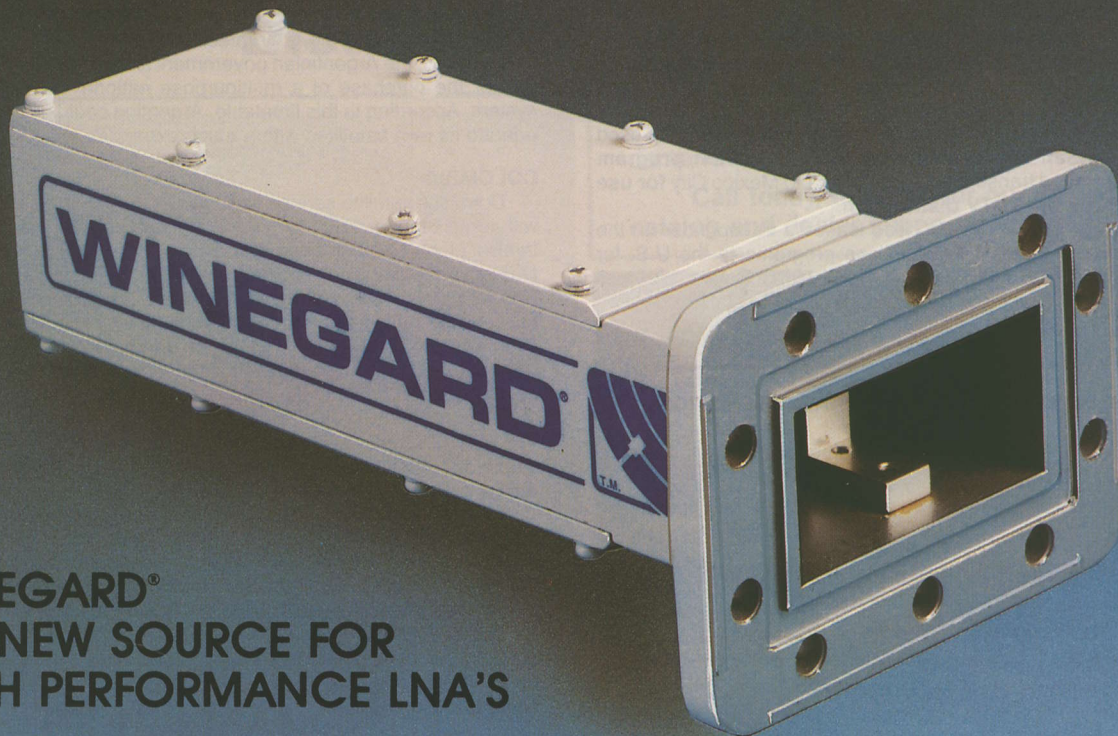
The first "private" domestic satellite telephony link was established in October 1983 when Petroleos Mexicanos (PEMEX) inaugurates its 24 channel satellite telephony link between Ciudad del Carmen and Mexico City. PEMEX plans to expand its telephony network beyond this initial link as soon as earth stations can be installed on some of the oil platforms.

Presently, Mexico is leasing from INTELSAT three spot beam transponders (at 32.7 dBw at the country's edge) on the Intelsat IV F-1



MORELOS K BAND COVERAGE
(108 MHz, 20 W)

THE EXTRA EDGE



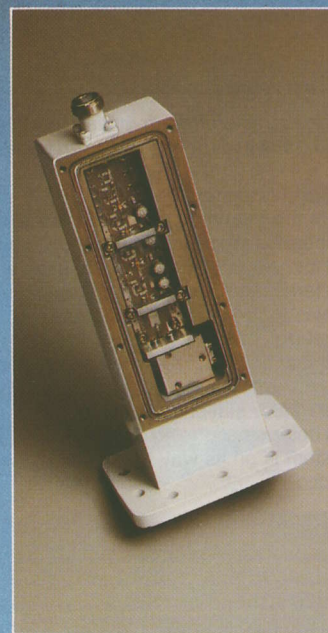
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built by Hughes and launched in May 1975. Although this satellite has exceeded its 7 year design life (which is fuel-dependent), Mexico expects to use it until May 1985, when the first Morelos domestic satellite will be launched. This confidence is based on the extended lifetime of Intelsat IV F-7, which the present Intelsat IV F-1 satellite replaced. Intelsat IV F-7 had exhibited a useful life in excess of 10-1/2 years when it was retired because it ran out of fuel.

The three leased transponders provide TV distribution of four TV programs. In addition, half the capacity of a transponder is used by PEMEX for SCPC telephony. A government TV channel occupies one transponder, and another transponder is used to distribute two commercial TV programs (Televisa). **Another half transponder** is used to distribute a **San Diego-originated U.S. television program** picked off the air and transmitted from Tijuana to Mexico City for use by **CABLEvision for CATV distribution**.

In addition to Intelsat, Mexico also leases a transponder on the Galaxy satellite to transmit live Mexican programs to the U.S. for distribution by Spanish International Network (SIN). Galaxy 1 (as well as Westar 4, which it replaced) is a Hughes HS 376 satellite operated by Hughes Communications, Inc.

TABLE 3. MORELOS SATELLITE CHARACTERISTICS

Characteristic	Value, Name, or Date
Transponders	
C band, 4/6 GHz	12 at 36 MHz at 7 W (+ 2 spares) 6 at 72 MHz at 10.5 W (+ 2 spares)
Ku band, 14/12 GHz	4 at 108 MHz at 20 W (+ 2 spares)
Design life (fuel dependent)	9 years
Launch vehicle	STS/PAM
Construction contract initiation date	October 1982
Launch dates	May 1985, September 1985
Orbital locations	113.5°W and 116.5°W
Operator	Secretaria de Comunicaciones y Transportes

With the accelerating pace of earth station installations, Mexico estimates that **by mid-1984** it will need to lease **an additional Intelsat transponder**.

The Morelos satellite is Hughes' first hybrid HS 376 satellite. The **C band wide channels** are intended for digital trunk telephony, while the narrow band channels are to be used for analog telephony and TV. K band is to be used for rural telephony and TV, data, and private line networks. Mexico is targeting some social areas for particular attention: educational television, health and family planning, and agricultural education. The social benefits of these efforts will be felt increasingly as the number of installed earth stations increases. Some 10 years into the future, the Morelos earth segment is slated to include approximately 10,000 earth stations — an ambitious but realizable goal, given Mexico's determination and drive to get the job done. The Morelos satellite system is on its way to becoming the new servant and liberator of Mexico.

ARGENTINA

Domestic systems operation via leased Intelsat transponders was inaugurated in Argentina in April 1982. Today there are 31 earth stations using 11 m antennas and the 13 m master station in Balcarce. In addition, there are two mobile (trailer-mounted, 11 m) stations and three easily transportable (6.1 m) stations. All the stations have transmit-receive telephony capability and a channel complement ranging from 5 to 64 telephony circuits. Interconnectivity between stations is to be achieved through a DAMA network. Two submaster stations in the north and south of the country can be used to back up the master in Balcarce.

Three more 11 m stations are being built for installation in the near future. The services provided by the Argentinian domestic satellite

network include telephony plus one TV channel and one radio channel. The TV and radio programs received by the earth stations are rebroadcast by local transmitters operating in the standard broadcast bands.

These services are provided by leasing one and a half global beam transponders in spare capacity on an Intelsat IV-A, F-4. This satellite, built by Hughes and launched in May 1977, is presently operating satisfactorily beyond the guaranteed 7 year life.

Recently, the Argentinian government issued an international tender for the purchase of a multipurpose national domestic satellite system. According to this timetable, Argentina could by 1986 or 1987 operate its own satellites with a much expanded terrestrial network.

COLOMBIA

Domestic satellite service was initiated in Colombia in June 1982 with three Standard B (13 m) earth stations and the lease of half an Intelsat global beam transponder. Since then, 14 more earth stations (7.5 m) were installed, and in July 1982, an additional half of an Intelsat hemispheric transponder was leased. Five more earth stations will be added to the network within the next two years, two of them in 1984. At present, the services offered are 1 channel TV and telephony, with the stations having a telephony circuit complement of 12, 24, 60, and 120 circuits.

A tender for two SATCOL satellites was cancelled in September 1982. ENTEL and other government agencies are now conducting studies to reassess the requirements for a domestic satellite system in the context of a new telecommunications plan.

By the time SATCOL is launched, or even before, an additional 150 light traffic stations (4.5 m) will be installed in the first phase of a massive effort to establish a versatile domestic network. Initially, they will be for TV reception and a few circuits of telephony. The service requirements for this network include: rural telephony, entertainment TV, and educational TV. In the second phase of the terrestrial network buildup, the planners foresee the installation of several thousand earth stations to provide every town and village with adequate telecommunications services.

VENEZUELA

Domestic satellite service began in Venezuela with the lease of one Intelsat V transponder in September 1982. At present, the earth segment consists of an 11 m transmitter in Cantaura and two TV receive-only stations — a 9 m nodal station in San Fernando, Apure and a 7 m station in Puerto Ayacucho. A third, 7 m earth station is to be installed in Sta. Elena de Uairen.

The TV programming being distributed is that of one of the two government networks, and it includes commercials. In the near future, an additional 21 TV receive-only earth stations will be installed, bringing the total to 24. Venezuela's CANTV is considering leasing a second transponder to add telephony and telex to its satellite services. For the time being, the purchase of a satellite system is **not** being considered.

CHILE AND PERU

Chile now has two Standard B (11 m) stations and one 18.2 m master station in Santiago. These stations provide telephony service between Santiago, Punta Arenas and Coihaique by leased use of half an Intelsat IV-A global beam transponder.

The Peruvian domestic system consists of earth stations in three towns in the eastern jungle of San Martin: Juanjui, Tochche and Saposa. Telephony services are provided from three towns to the rest of Peru. Four other villages are connected via UHF/VHF radio telephones. The lease of 1-1/4 Intelsat hemispheric beam transponders also provides for TV distribution to the stations. Three additional 6 m TV receive-only stations are planned.

SUMMARY

The picture that emerges from this short "status report" is of a vigorous, determined effort by Latin American countries to expand their telecommunications by satellite. Sixteen and a quarter leased transponders are being used by the seven nations mentioned. Two national satellite systems, Brazil's and Mexico's, are currently under construction.

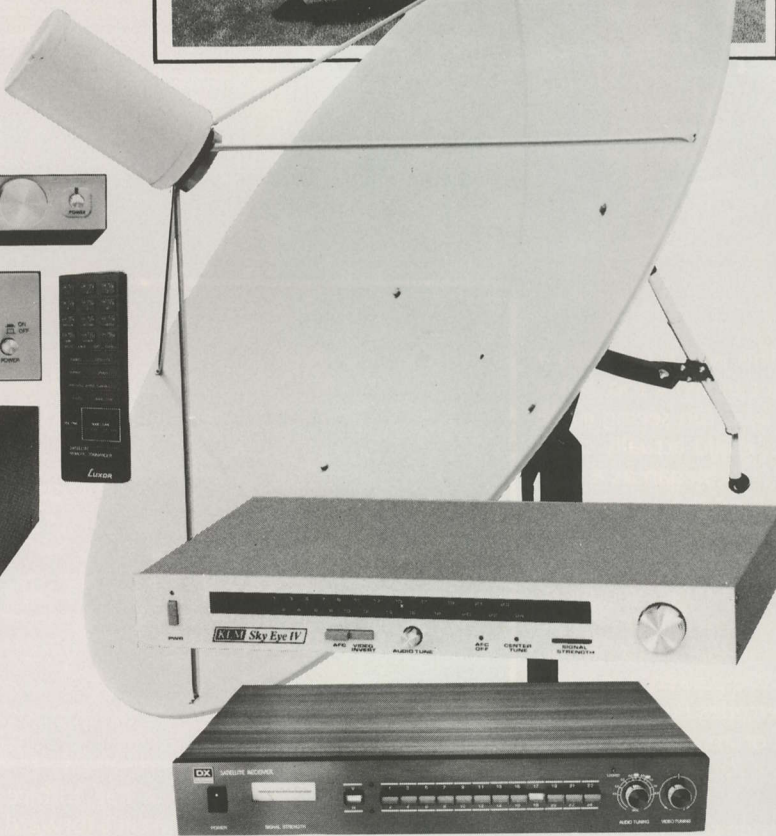
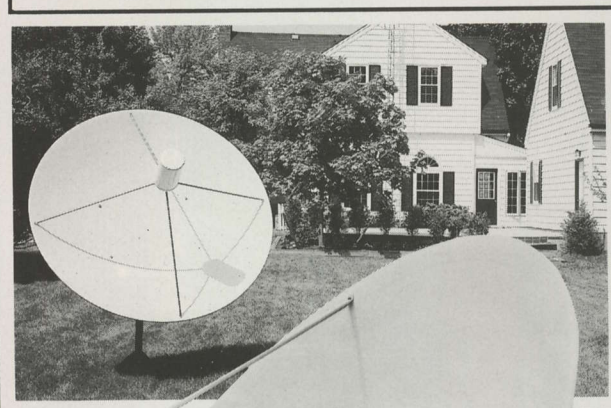
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Mark Fator, photographer

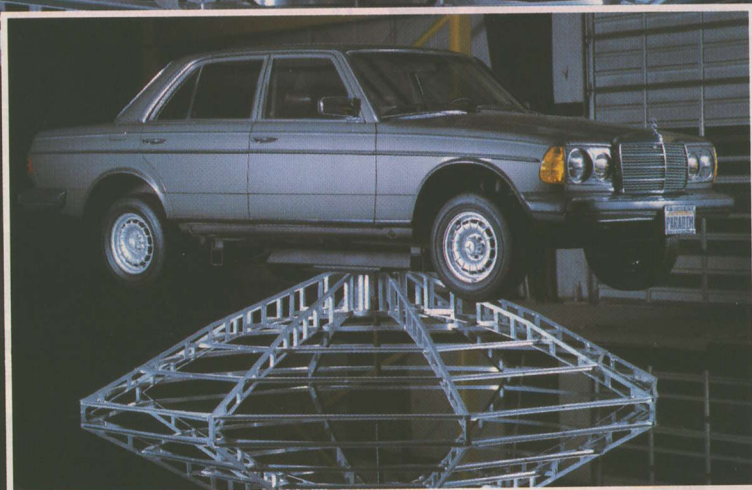
This was fun. It was a lot of work too, but it was fun seeing if we could actually do it.

It began as a little sketch on the margin of a note pad, and after a great deal of thought and a huge amount of convincing — Mike

loaned us his car.

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The total dead weight was 4,522 pounds. Total deflection under load was 1 inch and when the whole ordeal was over, the hub plate was only .45" closer to the floor than before.

Last year, during a "destruction test," we dropped 5,200 pounds of steel stock on the same antenna; so we weren't really surprised when this stunt worked.

What does it prove? Just one thing: We build a very, very strong antenna.

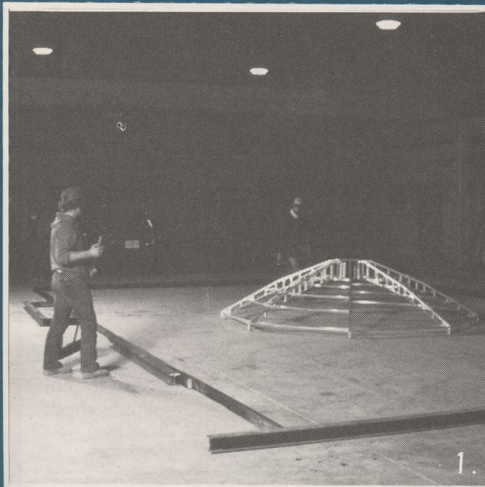
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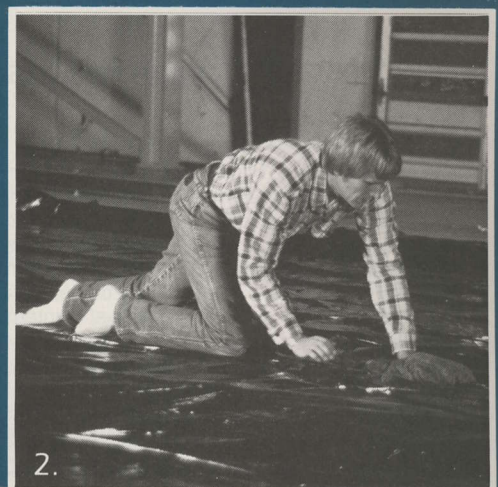
1.

1. The reflective pool required a large open space. Steel I-beams and 2x4's formed the perimeter of the pool.

2. John Steven, marketing, cleans the seam between the two 50 ft. sheets of plastic that held the water for the reflective pool.

3. Gene Willyard, production manager, looks for the balance point while Raul Espitia, tool crib mechanic; directs the crane operator.

4. Mike Andrews, Paradigm V.P. and car owner, posed for one last shot prior to moving the car to the antenna.



2.



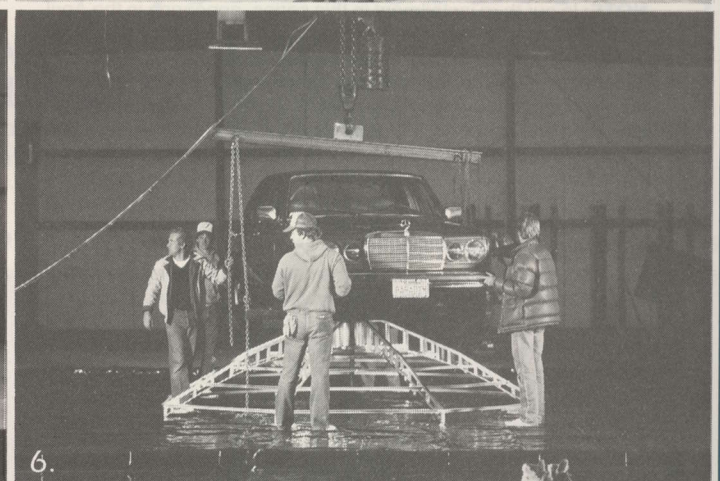
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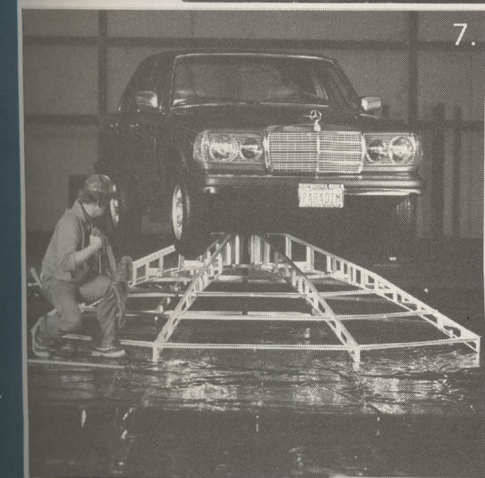
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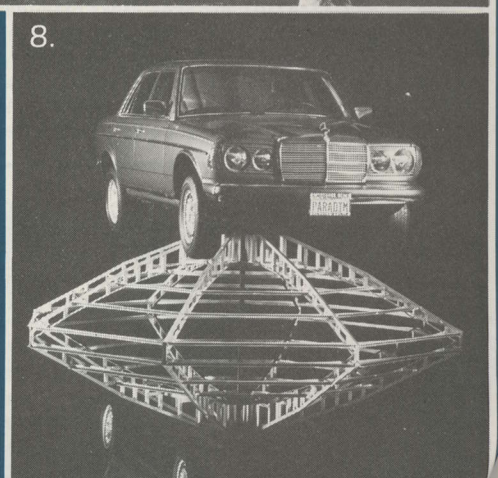
7.

5. The car is inched into place with Mike at the control switch, Gene and Raul steady the load.

6. With the full weight of the car resting on the antenna, we gingerly remove the steel tubes that were used to lift the H-rack. Left to right; Gene Willyard; Toby Elder, powder coating foreman; Bill Ulich and John Steven.

7. A final dusting before the water is turned on, 3½ hours later the car was on the ground.

8. That's how we did it. We don't recommend you try this stunt at home. It isn't for the faint-hearted or the ill-equipped.



8.

growing by leaps and bounds. In developing a domestic network, each country has established different priorities. In Mexico, the initial impetus has been to distribute four TV channels to its 200 earth stations. In Brazil, the effort has been to bring telephony to Amazonia and the Mato Grosso first, and then to let **private companies** add TV distribution. The record so far indicates that a domestic satellite system using leased transponders is highly beneficial to internal communications, because two out of the seven nations are already procuring their own satellites and another two are seriously considering doing so soon.

Satellite communications growth for internal use will easily exceed 20 to 25 percent per year within the next few years — a good indicator of healthy economic growth in Latin America.

SMATV SYSTEM ENGINEERING/ (Part 4)

NOTE: In our third installment in this series, appearing in the April issue of CSD, we concentrated on the characteristics of the cable itself, and began a look at the options available for installing that cable. We determined that you can rent pole space from the local telephone (or power) company to 'hang' your SMATV cable lines overhead on existing (or planned) poles. We also determined that there are minimum 'safety requirements' that apply in all states; there must be a certain (minimum) space or distance between the power company lines at the top of the pole and the telephone and/or cable lines lower down on the pole. **And**, there must also be some minimum distance or space between the lowest lines on the pole and the street or ground below. We ended our April segment by noting that there are established contract procedures which allow you to rent 'pole space' from the telephone utility (if the poles are shared by both power and telephone), or by the power utility (if the poles in question have no telephone lines on them). Rental charges are 'supervised' by the Federal Communications Commission and fall in the \$3 to \$7 per pole (per year) region. However, there is something called 'make-ready' which deals with the power/telephone utility having to re-arrange their existing lines on (a) pole(s) so there is adequate 'safe space' on the pole for your (SMATV) cable lines. Make ready can be very expensive since it involves physical movement of power/telephone lines on an existing pole, or even replacing a pole with a taller pole in those instances where the pole is simply 'not tall enough' to allow the safe insertion of your new (SMATV) cable line onto the existing pole. This month's fourth part in this series takes up at that point.

Once you have tossed all of these factors into consideration, now you are finally ready to look closely at how much cable you will need, and where it will run. Start with a map, locally produced by you or obtained from a utility company or the developer and locate all of your present and future potential service drops. **The headend should be located as close to the center of the project or community as possible** because of something called 'amplifier cascading.' The problem here is that you want the total length of cable from the headend to the furthest away homes to be as short as possible. You will probably use about the same amount of **cable** whether you start at one end and wire to the opposite end, or, start in the middle and wire

Elio Sion of the Space Communications Group, Hughes Aircraft Company (El Segundo, Ca.) is charged with the responsibility of overseeing the present day as well as the future coordination of every Hughes communications satellite still in active service. In this paper, originally prepared for a telecommunications conference in Argentina, Mr. Sion reviews the present day and future activities in South America in the 4 (and 12) GHz satellite service area. While most of the data has been previously reported, in 'tid-bit' form in **CSD**, a comprehensive overview of the South American (and Central American) formal use of C and K band satellites has never previously been published. We are indebted to Mr. Sion for his work in this field.

'out.' However, in systems where you require multiple amplifiers to reach from one side of the project to the other, you will save amplifiers if you start in the middle (so-called 'hub approach') and wire outward in as many directions as you need to go.

Each time you must add an amplifier, on a line, to 'boost' the signal, we have a measurable amount of **signal degradation**. There is something here which 'squares' in terms of interference. One amplifier has twice as much (measurable) interference as no amplifiers (i.e. serving every home from the headend alone). **Two** amplifiers have **twice** as much interference as **1** amplifier; **four** amplifiers have **twice** as much as **2**, **8** has twice as much as **4** and so on. Double the number of amplifiers and the permissible levels of (cross-modulation) interference get **3 dB** worse. If it takes **8 amplifiers in a line** to get **across** a project from one end, but only **4 amplifiers** in each of two separate directions to go from the **middle** in both directions, you are better off starting in the middle. So we have yet another consideration for the system planning.

You have to 'play with' all of these factors as you plan your system.

- 1) Locate the headend, if you have that choice, so that it serves the area equally in different directions, rather than all in one direction (or predominantly in one direction).
- 2) Decide whether your SMATV cable plant is to use a dedicated trunk approach, or if you will allow customer service taps to be inserted into the headend output cable.

What is that all about?

TRUNK vs. Feeders

Real cable TV systems, serving whole communities, use two different types of cable plant within one plant. The premise is this:

- 1) While all cable has loss, and every line splitter reduces the available 'RF power' on the line by breaking it up into (mostly) even parts of 2, 3 or 4, there is one device which has a profound effect on the **signal levels** on the line; **the subscriber tap-off units** or 'directional taps.' If you run a single line from the headend, and install directional taps for subscriber service on that line, you will invariably end up having to place amplifiers more often to compensate for the 'loading factor' of the taps (DTs).
- 2) If you install a 'main' cable out of the headend (called a trunk) and use that cable solely to carry RF power to the various regions within the development/community, you are able to do a better job of maintaining 'pure' or 'high quality' service to the community as a whole.
- 3) The trunk cable leaves the headend, in one or more directions, and it follows the 'main arteries' of the community area. The object with the trunk is to get the signal as far as possible, without amplification (or before re-amplification). Where you need to provide 'service drops' you use a unit called a 'bridger' to take signal out of the trunk and into a secondary type of line called a 'feeder.' It is on the feeder lines where you install the DT devices and into which the customers are plugged for service.

Let's boil that down first to a single building system; say a high-rise apartment building.

- 1) We exit the headend with a **1/2 inch trunk** cable. The trunk goes from the bottom of the building to the top floor, vertically.
- 2) As we pass by each floor of the building, we install a bridger unit and into that bridger we plug one or more '**feeder lines**' using



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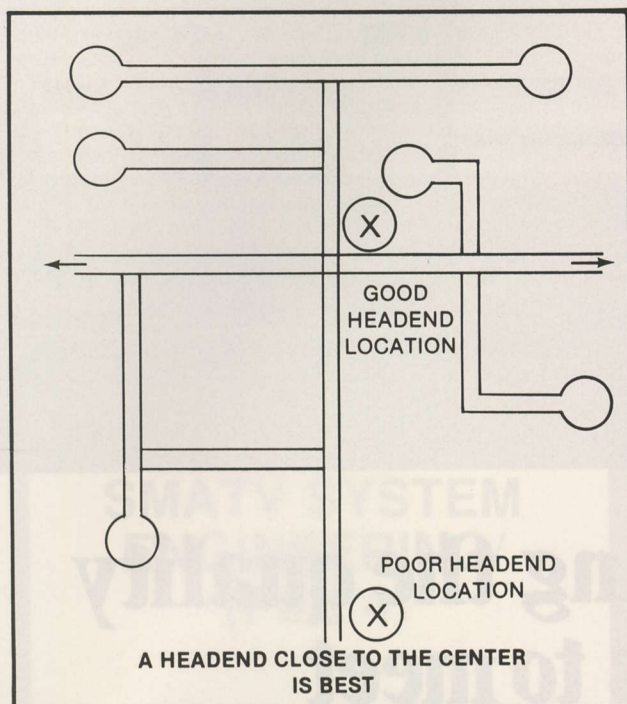
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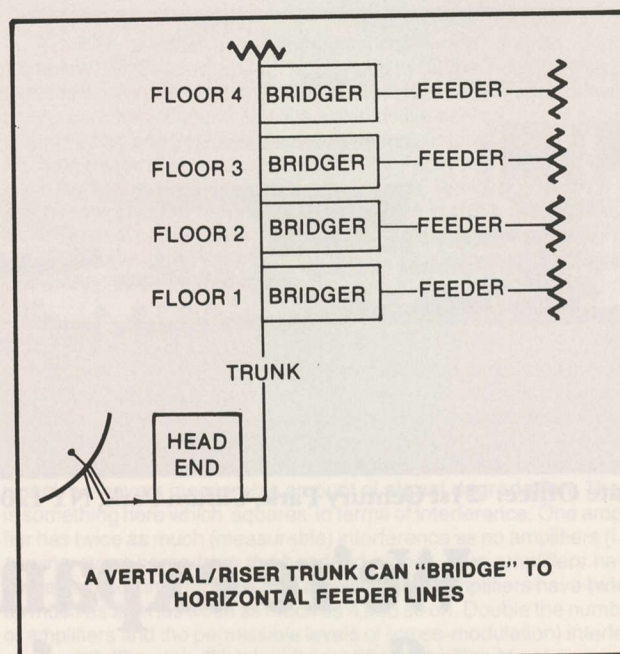


smaller (.412 or 'four-twelve' as it is called) cable. The feeder lines pass down the main hallway of the floor so that they go by each apartment on the way to the opposite end of the building.

- 3) Into the feeder line(s) we install **DT devices**; they 'suck out,' from the feeder line, a carefully controlled amount of RF signal for delivery to the individual apartment.
- 4) From the DT to the apartment TV set location(s) we run a piece of **RG-59/U** cable, finally terminating the line in a matching transformer or wall outlet within the apartment proper.

If we are dealing with streets rather than a single high rise building, our system is the same; only the nomenclatures change. **The trunk runs down 'Main Street'** and at the **corners of Elm, Oak, Cypress, Maple and Pine we install bridgers**. These bridgers interface between the 'Main' trunk and the 'Elm, etc.' feeders. In front of every residence or every other residence we install DTs to carry on into the house via some RG-59/U drop cable.

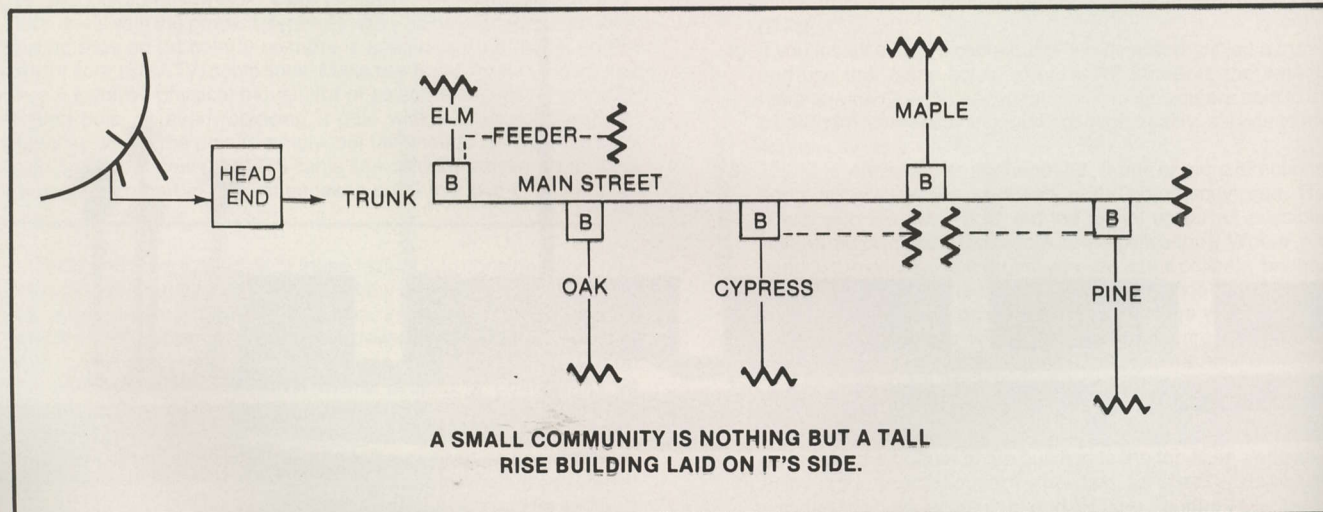
Then if we want to serve individual subscribers on 'Main Street,' we don't plug them into the trunk; rather we 'fold back' a feeder output from the bridgers at say Elm, Cypress and Pine so that one of the bridged-feeders from each of those corner locations goes back up (or



down) Main Street, along with the trunk cable, to provide customer service outlets along 'Main.' Each street has a single cable, **except for Main Street**. Where, along Main, we need to provide service to customers we place a second (feeder) cable for that express purpose.

Such an approach is 'pure' but frankly not necessary if you can lay out your system so that you will reach every location you need to reach within say 3 (**maximum**) amplifiers from the headend, while using the **single (trunk) line** from the output as both a trunk and feeder system. This one-cable, dual approach system is called a 'tapped trunk' simply because you are 'tapping into' the trunk for customer service along the way. We'll look in some detail at both approaches, and where you draw the line.

If the tapped trunk approach is 'less pure' than the full-trunk plus-feeder design, there is at least one more design approach worth considering which is even less pure; a **looped feeder system**. The concept here is that to save money, typically within a building such as a three or four story apartment house, you calculate how and where you will run your cable to get from the headend to the last outlet on the system. Let's say you have it figured out so that you come out of the headend with a two-way split and then go off in two different directions to carry the signal to each apartment. Your system will be within the confines of the single building, and you can use RG-6/U or RG-11/U to





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do all of your cabling. You would like to avoid the cost of the **directional taps**.

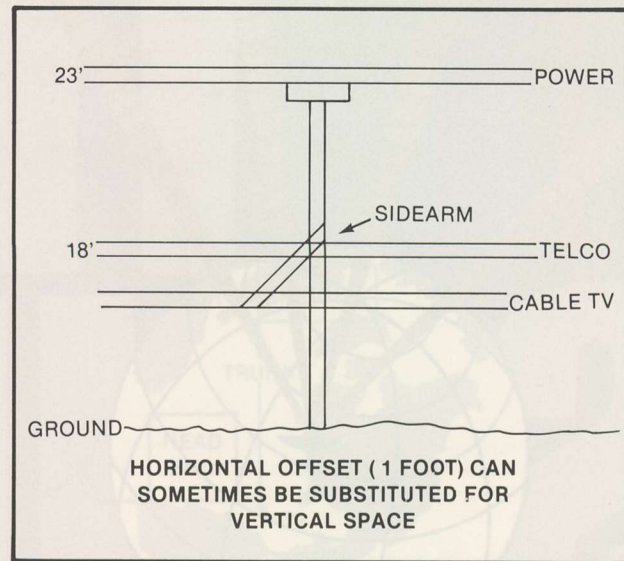
The idea is that you will come to the apartment from the direction of the headend with the (RG-6/U or other suitable) cable, connect **into** a signal tap-off device **within** the apartment, and then **come out of** that signal tap-off device and **'loop on'** towards the next apartment. You break (or cut) the cable at the 'tap off device, to insert it in the line, and then carry on to the next location. You can put some finite quantity of such tap outlets in a line (series) before running out of signal.

The tap off devices typically are wall plate units, that install in standard 2" x 4" wall boxes. They have a wall plate cover so that the part facing out, towards the (living) room reveals simply a harmless looking female 'F' fitting. The subscriber will plug his TV set, through an RG-59/U jumper, into the wall plate outlet. **Within the 2" x 4" box**, you bring the RG-6/U or other cable into the box from the bottom, rear or top, connect to one of the two connection points **on the back of the wall plate unit**. A second cable, leading onwards to the next identical location, connects to a second connector on the back of the wall plate unit and exits from the 2" x 4" box to pass on down the line.

This sort of wall tap comes in many different trade names; Jerrold, for example, calls them 'Ultra Taps' or DFT units, or, Omni-Taps. Each is slightly different in design but they all have the same premise; to avoid having to install a separate, perhaps costly, directional tap device in the feeder cable line, and then run an associated piece of RG-59/U cable to the subscriber receiver.

(The primary disadvantage to the wall-plate, loop-through tap-off device is that it offers the installer less of an opportunity to maintain 'isolation' between any two television receivers connected to the same line, and less opportunity to insure that each set on the line receives a prescribed level of signal. The Jerrold DFT series actually includes a miniature DT called a 'directional coupler,' which you select based upon the signal level on the line at the point of connection. There are different values for different signal levels. The Jerrold **Omni-Tap** has a built-in, installer accessible miniature signal level control which you adjust with a signal level meter to insure that the proper amount of signal reaches each set at each location. A 'looped system' has the further disadvantage that you cannot (gracefully) disconnect a single subscriber from the system without **entering** the apartment, **taking apart** the wall plate, and **unhooking** the tap to the wall plug. In a situation where people pay for the service, and may discontinue paying which in turn requires that you discontinue the service, this is obviously not a very satisfactory arrangement. A pure DT-fed system, with each customer service line individually accessible by the system operator is a far better approach.)

Let's go back to our original pole requirements; 23 feet of vertical space between the top of electrical and the ground. And let's assume



our pole is precisely 23 feet above ground; no room to spare.

Where do you attach the cable TV lines?

There are two instant possibilities here.

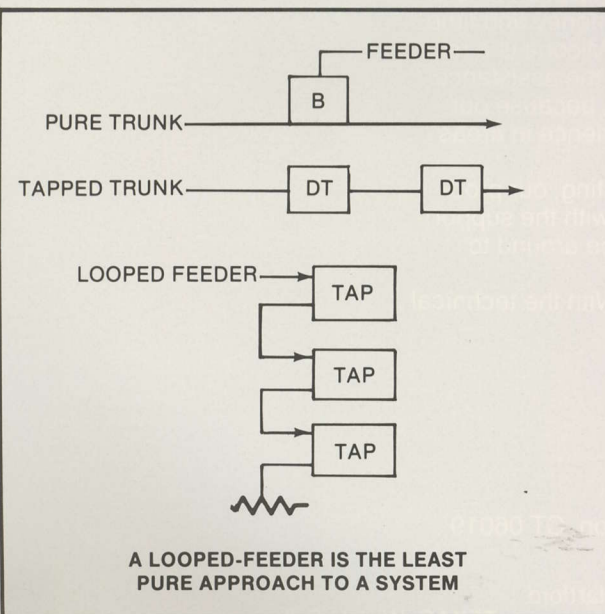
- 1) The CATV cable will be placed on an outrigger device called a 'sidearm.' If you cannot get your required one foot of separation between telco and cable vertically, up and down, you get it more or less horizontally; out to the side. You, the cable operator, will pay the cost of this 're-arrangement.' If you are fortunate, the telco will let you buy and install the sidearms. In some agreements, they reserve that right (under a 'make-work' policy for telco employees).
- 2) Or, they can 'change the pole out.' That is, to get you the additional one foot required, they put in a taller pole. Yup, you are right. That will cost big bucks and you, the guy that needs the 'space,' will pay the tab. \$300 is pretty common. If you happen to get onto a pole that has monster power transformers, both primary and secondary power lines, it could be a couple of grand. Obviously a sidearm is the preferred way to go.

"Make ready" really means that the telephone company, perhaps the power company as well, must make 'change outs' on their poles to get you the legal room you require. Make ready will cost you money since they are making ready, or room, for you. It could amount to lots of dollars.

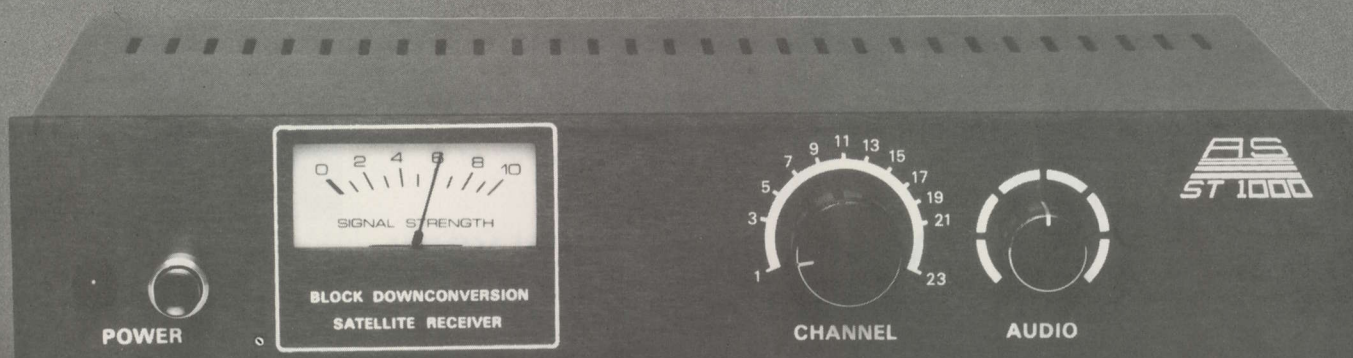
Every single pole that you want to attach to must be inspected. You, and an engineer from the telco will 'walk' the plant and he will make notes on his plant map as you go along. Then he will make up an estimate of the costs of 'make ready.' This will only happen AFTER you have negotiated and signed a contract with them (they don't walk pole plants and spend engineering time on the premise that you **MIGHT** rent from them) and possibly only after you have paid them a fee to engage in this 'walk out.' And that will happen **ONLY** AFTER you have a signed, legal contract with the developer or community you will be wiring. Telco is under no obligation to rent pole space to somebody who drops in off the street; only to people or firms who have some granted, legal right to provide cable TV service in the area.

Of course you could bury your cable plant. Underground. If the power and/or telco utility is already buried, there are probably no poles and you will have to go underground anyhow. We will hope that you got started with the developer BEFORE he had all of his roads in and paving done. Cutting up paved roads, boring under sidewalks and using a diamond tipped concrete saw to work your way through a concrete jungle is a good way to go broke in a hurry.

A buried plant that can be 'trenched in' using a **Ditch Witch** or other shallow depth digging and burying machine **can compare** favorably to a plant that has to go on telco poles. First of all, you avoid pole



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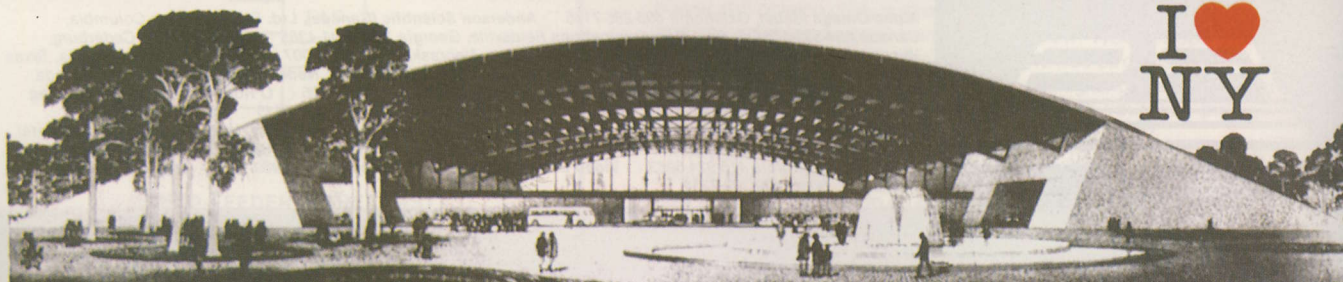
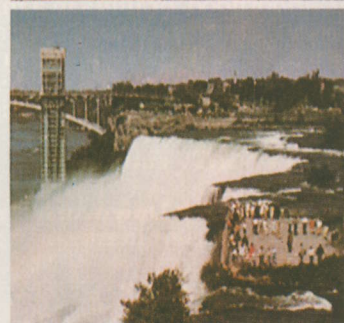
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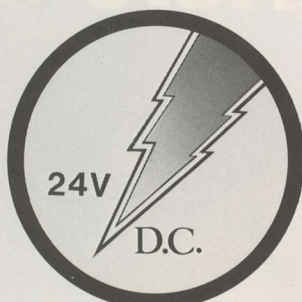
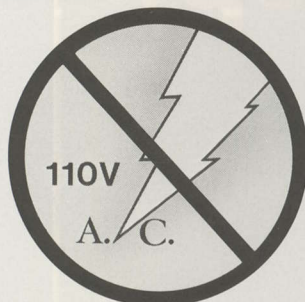
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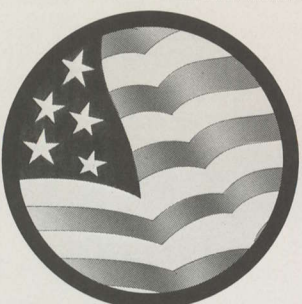
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Most antenna drive systems suppliers depend on outside vendors for the motor/gearbox/tube assembly that goes on the dish. The Saginaw Steering Gear Division of General Motors is a popular choice. At Superwinch we build our own *complete* system, actuator included. Why do most of our competitors buy instead of build? Because many do not have the expertise, or the manufacturing facilities to make their own. Because we build the complete system, we can do it at less cost and control the quality, performance, and delivery of the entire system. We don't blame the actuator vendor if the system fails. *We take responsibility for the whole system.*



Frankly, we are not impressed with the quality of most imports. Furthermore, lead times can be long, deliveries problematical, and warranty obligations difficult to enforce. Often, the initial costs of imported products are lower. *However, Superwinch believes that our interests and those of our customers and our country are best served by the finest label of all - Made in the U.S.A.*



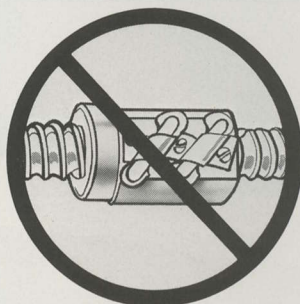
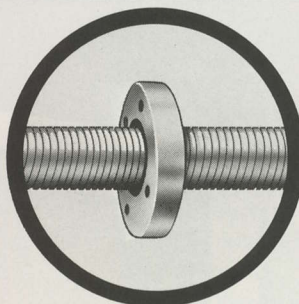
This magazine probably contains at least one ad for a new actuator supplier. We have nothing against new enterprises - we were one in 1970. As a buyer, you should assure yourself that your supplier has substance, that he'll be there when needed, and has the resources to help you if you have problems. As a clue, check to see the supplier's level of support for our industry association - SPACE. Only 3 of the 63 actuator suppliers are Pioneer members of SPACE and only 2 are committed contributors to SPACE's Superfund. *Superwinch is both.* Since 1970, we've built over 500,000 electric lifting and pulling machines. *Superwinch will be here next year.*



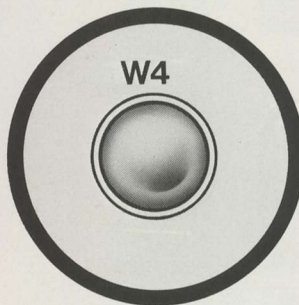
POT, short for potentiometer, is more common in the TVRO industry than at rock concerts. POT's are a means of determining where your dish is aimed. They have a serious drawback, in our opinion, in that they are temperature sensitive. Unlike most of our fellow suppliers, we start with a benchmark (the Down Limit Switch) that positively provides a 0.0.0. reading every time. Using magnets and a magnet-sensitive switch, we count up from 0.0.0., each digit representing 80/1000ths of an inch of travel. It's accurate, less costly, and can always be reset to zero by fully contracting the actuator. *Superwinch has never used POT.*

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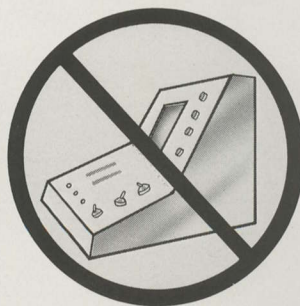
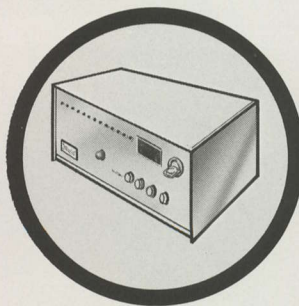
The two common driving mechanisms in an actuator are a ball screw or an Acme screw. We prefer the Acme. Why? Because it's simpler than a ball screw and is, therefore, less costly. Because it has less backlash (slop) in its construction, it is more positive, accurate, and won't rattle in a high wind. *Superwinch uses only Acme thread drives.*



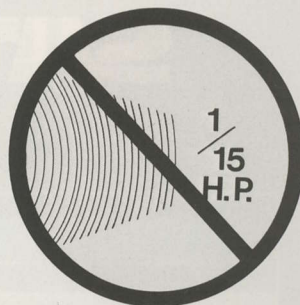
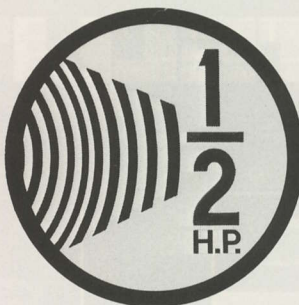
Many actuator controls look like telephones. Keypads, switches, and buttons galore. You don't want to call long distance; you simply want to go from, let's say, F3 to W4. Perhaps you can remember the codes but can other members of your family do the same? On our Skywalker II, you release the Select button when the scanning light comes to rest on the bird you want. You key in nothing. Initial programming of all the satellites takes 15 minutes. *No lengthy warm-up period required.*



Appearance is an important consideration. Our controls no longer look like model railroad transformers (we confess, they did at first), nor do they sport wooden sides like bookends. Our controls are high tech and they look it. Everything is in one package (do you really need more boxes and wires in your video setup?). All Superwinch controls use an extruded brushed aluminum face with pebbled black vinyl covered top and sides. *It looks good and it works better.*



It's been said that our Skywalker actuator is noisy. Compared with others, it is. After all, a Kenworth or Peterbilt makes more noise than a Honda Civic - but it also gets more done. Our 1/2 HP motor coupled to our solid steel geartrain generates more sound than a 1/15 HP motor driving plastic gears. Your compensation? Our Skywalker can be used on small dishes, sure, but also on 12 to 15 footers. Snow, ice, and cold don't bother us. Beware of the fine print ("suitable for smaller dishes in mild climates"). At *Superwinch, we believe there is no substitute for adequate power.*



*Our agency said this ad was too long, too busy. They said you wouldn't take the time to read it. We ran it anyway because you've got a lot of choices in actuators and we believe that your informed choice will benefit both of us.

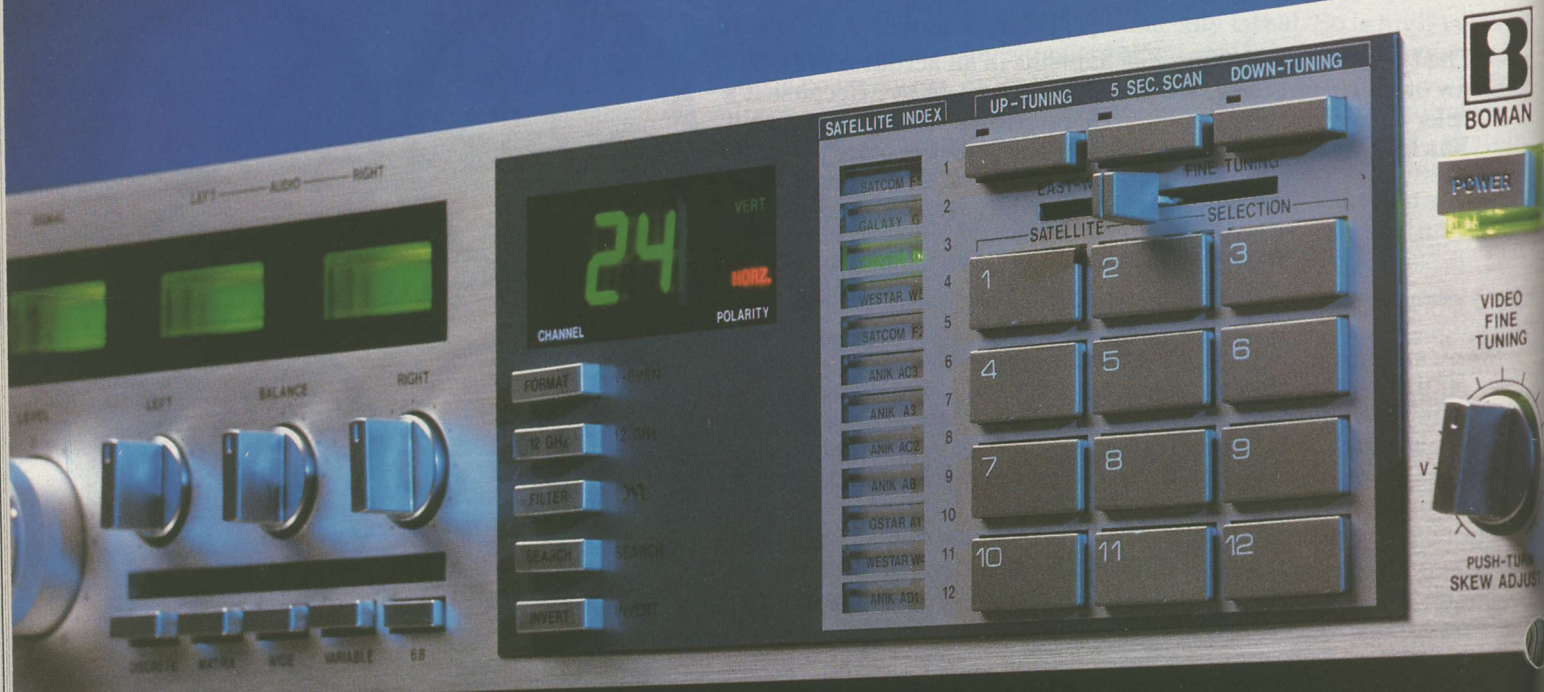


SKYWALKER

FOR ADDITIONAL INFORMATION WRITE TO:

SUPERWINCH Dept. 10 • WINCH DRIVE • PUTNAM, CT 06260 • TEL. 203/928-7787 TELEX 643981

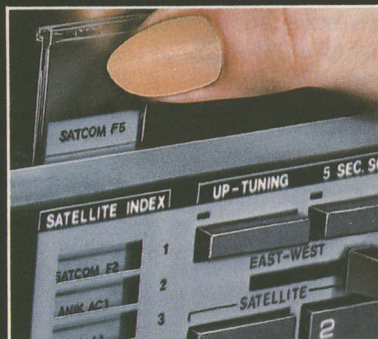
ALL IN ONE



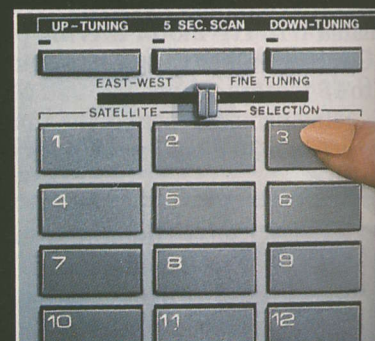
STEREO SATELLITE RECEIVER



The **AUDIO GROUP** provides superior *Stereo* reproduction to ensure viewer satisfaction.



The removable **SATELLITE INDEX** assures constant Satellite identification while viewing.



The **SATELLITE SELECTION GROUP** provides dish movement and fine tuning along with channel selection and 5 second scan.

The ultimate combination of product innovation, user convenience and value . . . ALL IN ONE unit.

INTRODUCING . . .

The all new - All in One Super Satellite Stereo Receiver from Boman Industries.

Convenience and style combined with the latest in TVRO technology makes the Boman Model SR2500 the receiver to which others will be compared.

Audio Group



Left-Right audio channel tuning is adjusted by separate controls. A balance control is provided for attaining that perfect stereo effect.

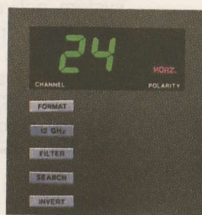
Separate meters showing Signal Strength and Left-Right audio levels are provided with soft green illumination.

The pushbutton group consists of the "Discrete" and "Matrix" stereo buttons. Bandwidth is expanded by use of the "Wide" button. These three controls enhance the reception of all available audio transmissions.

The audio pushbuttons offer a choice of preset 6.8 tuning frequency for most video channels and variable audio for stereo or sub-carrier reception.

The Detent Volume control adjusts the volume and adds to the attractive design of the stereo section.

Function Group



The attractive display panel shows channel number and polarity position in a soft green color.

The 12 GHz button changes the operation of the SR-2500 from 4 to 12 GHz when used with appropriate 12 GHz hardware.

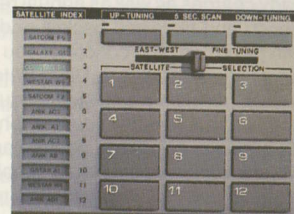
The Format button transposes the polarity mode when receiving signals from the few satellites with reversed polarity signals.

DNR function provides a filtering of background noise from the audio thus providing very high quality audio performance especially on weaker signals.

A Search button gives a fast scan of all channels and is of assistance during the initial alignment and orientation of the programmable moving control.

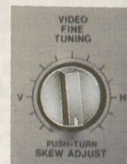
The Invert button is provided for reception of inverted video signals.

Satellite Selection Group



Satellite selection is accomplished with the 12 pushbutton pad. The interfaced control then automatically moves the antenna to the pre-programmed position.

Video Fine Tuning and Skew adjustment is made quick and easy using the dual function fine tuning control.

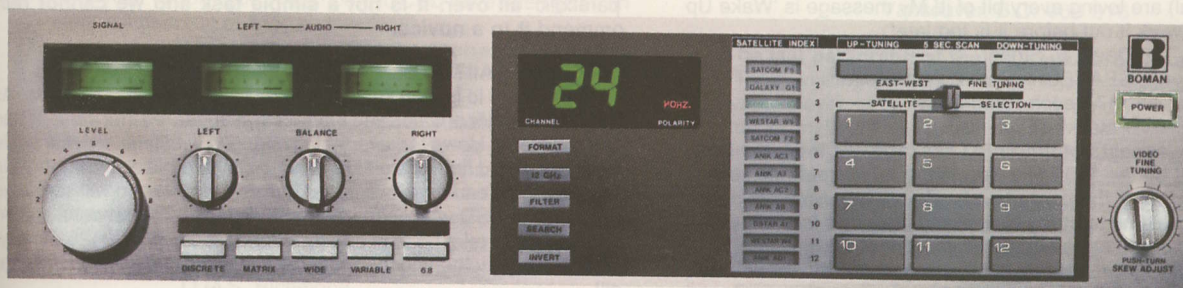


The "UP" - "DOWN" tuning buttons provide manual selection or scan of channels in 1 step or 2 steps and continuous operation. The 5 second Scan button allows the user to view each channel for 5 seconds during the 24 channel scan.

The East/West fine tuning control is used for that extra special antenna peaking which is sometimes required.

MODEL SR-2500

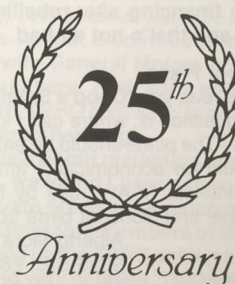
Use our toll free numbers to order yours today.



Other features found either inside or on the rear panel of the SR-2500 are:

- Automatic Polarity Switching.
- Command Tone Response:
A "Beep" audio tone is heard when any of the Feather-Touch push-buttons is used.
- LNA/Down Converter power remains on when the unit power is switched off: No more LNA/DC warm-up drift.
- Integrated Channel 3 - 4 Modulator.
- 1 - 2 Step Channel Advance Switch.
- Separate Sub-carrier Outlet.
- IF Gain Control.
- Parental Guidance Switch.
- Remote Control Switch.

Boman Industries



BOMAN INDUSTRIES
SATELLITE PRODUCTS DIVISION
9300 HALL RD., DOWNEY, CA 90241

TOLL FREE NUMBERS:
INSIDE CA. (800) 352-2553 OUTSIDE CA. (800) 421-2533

SMATV/ continued from page 42

make-ready charges as well as annual rental charges. Next, if you can simply trench and bury and backfill and move on, without having to tangle with pavement and concrete, you are going to move along at a 600-900 foot clip per day per Ditch Witch team.

Obviously there is a whole study required here and our intent is not to educate you in a few brief paragraphs of all you need to know to cope with buried or overhead cable plants. We only wish to caution you that there is more to this than simply stringing some cable from pole to pole or post to post and the 'more to' drives up the costs

quickly. We trust you will take the time to study a professional operation in this business area **before** charging into any sort of 'contract' with a developer.

NEXT MONTH/ part five will look closely at the planning of a coaxial cable network that carries AC operating voltages for the system 'active electronics' and how you insure there is enough voltage and current to run the system while not 'frying' any subscriber equipment in the process! (Copies of CSD for February, March and April are still available for those who would like a complete set of this important CSD series; call Carol Graba at 305/771-0505 or write to CSD for information.

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES. . .

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UP Front Not Good?

I believe Satellite Financial Planning Corporation provides a much needed service, but, their \$250 credit checking fee is just too much and it has cost them customers. Perhaps, as they suggest, they are 'up front' and do not disguise the fee in the form of higher interest rates; however, a lot of people won't go for it and several of my customers have gotten other financing because of the 'fee.'

HBO and Ted Turner 'DBS.' I feel that it is unreasonable for Turner or HBO to consider TVROs as retail customers for their service. After all, most of my customers have put out over \$3,000 for their TVRO. We TVRO owners should be viewed as wholesale customers by TT/HBO just as a cable system is handled and billed as a 'wholesale customer.'

Last, but hardly least . . . shame on SPACE and STTI! They are like two immature children fighting over a piece of candy. We've got more important battles to fight than to squabble over such stuff. I am sure HBO (et al) are loving every bit of it! My message is 'Wake Up SPACE/STTI'; work it out before it is too late!

David E. Stoner
SPACELink Satellite Systems
137 Beech Road S.W.
Pataskla, Ohio 43062

Of all of the aspects of the SFPC package, we too have been most bothered by the \$250 fee. Yet, when it is explained to you and they go through the costs involved, it is certainly not out of line. We took the time to study how many hours go into checking and approving credit apps and discovered that many cost SFPC, and the bank, far more than the \$250 charged. On the other hand, some also go through for around \$100 total costs. We commend SFPC for not sticking higher interest rates on and disguising the credit checking fee, but know as you suggest that it is a difficult one to explain to customers. If you had customers who obtained their own financing after rebelling at the fee, you still sold the system; and that's not all bad.

20/24 Foot Plans

I have read your **Coop's Satellite Digest** and find it very interesting. My question is, where can I locate or buy plans to build a 20-24 foot dish? The plans should be easy to understand and the construction should be economical. I am very interested in being able to receive Intelsat IV-A in use by Mexico as well as the Intelsat V, Symphonie and Gorizont birds from here in Miami.

Alberto Mora A.
9025 S.E. 28th Street
Miami, FL 33165

A 20 or 24 foot dish would never be 'easy to understand' nor

would it ever be economical. Certainly they are not totally out of reach as a do-it-yourself construction project, but the only way you get better reception with say a 20 foot than a 13 foot is to be very careful that the full surface maintains the true parabolic shape. To keep a surface this large in the shape of a parabola requires considerable attention to the way the surface is 'supported.' The answer is that you spend far more time and money building the back structure than you do the front surface. A BIG dish with an inaccurate surface leaves you worse off than a smaller dish with an accurate surface. When you get all done, you will have spent around 4 to 5 times as much for a 20 footer than you will have spent for say a 13 footer. Once you jump beyond 12/13 feet, the costs rise dramatically, a function of the ribs and support structure required to keep the total surface 'parabolic' all over. It is not a simple task and we cannot recommend it to a novice.

NO Coop At All?

Just a note to let you know I have resigned from Pico Satellite. As VP, GM, Director of Sales and Marketing, it appeared that indeed I had found a home. However, everything changes with time. Private cable is my home and first love and I intend to stay around and contribute in any way that I can. I have enjoyed our association and will scrounge up copies of **CSD** until I can settle at a new desk. If someone should ask, my home telephone in Jupiter, Florida is 305/757-0426. Finally, what is more frightening than 'COOP' twice per month? No COOP at all!

Elmer E. Pegram
4199 Robert Street
Jupiter, FL 33458

Elmer's contribution to getting PICO products into more dealer hands was impressive. Anyone out there looking for a cracker jack marketing man with top notch executive abilities? The telephone number and address appear above.

FEEDBACK On V.B.I.

The 'data pulses' one sees during normal Gorizont transmissions, which may look for the world like normal vertical blanking interval signals, are indeed not! This is an internal (Russian) system for transferring engineering and timing data for the point to point Moskva system. I have attempted to get the information to 'display' or 'print' with my English equipment but cannot make it do any of the correct things. As a start, the timing seems to be different from normal Teletext timing references. The News Exchange, which I wrote about

in the April issue (see pages 14 and 16) is the exception (on Gorizont), not the rule. One way you can tell the difference is to carefully study the bits of information in the vertical bar. These bits are very close together (100 to 120 per line) for Teletext while the Russian engineering data has long, flat, white areas which show up as repetitive. The Teletext(t) that will display or print is typically on Gorizont at 14 west between the hours of 1 PM and 6 PM eastern standard time (1800 to 2300 GMT), during the 'Intervision Exchange' slot.

Your comment about my apparent ability to copy 99% (+) error free copy is perhaps a sidelight of the system being used. Data is sent twice and then the parity bits are checked to ensure that there is 'good data' on a weighted basis.

Readers may be interested in my results to date using a home brewed 10.95-11.7 GHz receiving system. I am using a scalar horn feed, 7 dB noise figure mixer (no LNA!), and a 2.6 metre dish. On ECS at 13 east, I have reception from five television channels including Sky Channel (coded and scrambled, TV5 a French program transmitted from Paris each evening from 7 PM to 10 PM (Paris time) where the announcers also repeat everything in English (!), a German Test card with occasional programming. On the Intelsat V bird located at 24.5 degrees west, there have been a pair of channels up testing for T.E.N. (The Entertainment Network) which (was) scheduled to begin regular telecasts to English CATV systems with movies and specials on April 1st. Reception on all is in color but I am from 3 to 5 dB below threshold in each case. The estimated EIRP from the ECS bird is 47 dBw in my direction, while the Intelsat V bird estimates at 45 dBw. What I wouldn't give to have a lower noise front end!

Mike Stone
Baugh Farm
Church Lane
Downend, Bristol
England

Mike's interest in the TVRO field grew out of an electronics hobby interest. Firms looking for someone to test, in the field, 11-12 GHz gear in Europe would do well to contact him direct.

UNFAIR Charges?

I requested a sample copy of **CJR** in January and after receiving it, subscribed immediately. As a result of where I live, I sent in \$45 for the subscription to **CJR**. I now note that **CJR** has become **CSD/2** and in the process it will go to all domestic subscribers to **CSD** without any further charges. It follows that:

- 1) A number of domestic subscribers to **CSD** have been given an unsolicited credit of \$35, and,
- 2) A certain number of domestic subscribers can expect, at worst, a credit of this amount less the value of issues they have (previously) received, and,
- 3) We, the 'overseas subscribers,' are to **subsidize** the above groups to the tune of \$35 if we consider the \$10 difference between domestic and overseas mailing as a postage fee.

This is plainly discriminatory and quite unworthy of the honesty and high ethical standards which have heretofore been characteristic of Coop and **CSD**. I would feel very much obliged if Coop should see this.

Quentin Richmond
Q.M.S. Richmond
P.O. Box N 4676
Nassau, Bahamas

On the surface, it may appear that way. A brief recitation is in order. We started **CJR** for one single purpose; we felt that the **SPACE** dealer members were not getting \$300 worth of services from **SPACE** per year. A once-a-month copy of **CJR** was hardly going to even the score, but that was the limit of our 'donation ability.' We are not capable of making up for all of the ills of **SPACE**, but we felt we could try to do something. **SPACE** dealer members receive **CJR-CSD/2** at no charge. And that is discriminatory! This costs us around \$1800 each month; and we might add that virtually nobody has stepped forward to acknowledge that 'donation' from Coop. We hoped to 'break even' on **CJR-CSD/2** by getting enough other people to subscribe that we would eventually have a \$1800 per month 'profit'; i.e., setting aside the copies going to **SPACE** members gratis, we'd have \$1800 to claim as our own for the 70 or so hours per month it takes to

create **CSD/2**. Of course the first \$1800 we took in would only, in truth, break us even since we had already spent it to get the **SPACE** dealer members their copy of **CSD/2**.

With us so far? Good.

Well, it didn't work out that way. And at \$1800 per month it was clear to us that we might not be able to continue our commitment to **SPACE** forever so we sat down and refigured how much advertising it would take to make up the short-fall. The real problem was that **CJR-CSD/2** only had about half the circulation of **CSD**. To attract enough additional advertising, we had to be 'competitive' with ourselves; otherwise people would always opt to advertise in **CSD** rather than **CSD/2** (**CJR**). So we saw the only solution was to turn **CJR** into **CSD/2** and push ourselves to come out every two weeks. Now we have good interest in **CSD/2** and eventually it will have sufficient advertising where we can at least break even with it.

How does this impact on subscriptions? Everyone who renews **CSD** these days also pays for **CSD/2** since at least domestically the two are inseparable. The annual rate is \$65 if subscribers take **CSD** via AIRmail (the only way we will send it) and **CSD/2** via surface mail. Or, \$75 (domestic) for both, AIRmail.

There is a subsidy program here; but it is NOT the offshore (i.e. foreign) subscribers who are subsidizing; it is Coop. Until everyone has renewed at the \$65/\$75 rates, domestically, Coop is out big bucks every month. All because he saw an opportunity to do something, in a small way, for the **SPACE** dealer program and having given his commitment to do that something, is reluctant to back out. The non-US subscribers are NOT the losers, we assure you.

THE Dutch Are Coming

Note the ad clipping enclosed from a Vancouver newspaper regarding Philips, the large Dutch electrical/electronics firm.

After the Canadian Sat Expo here, I was approached by somebody representing the Bank of Kuwait to spend 30 days in the Middle East surveying some new communication system proposals. So I will be away from Vancouver between April 18th and the 20th of May. Also enclosed is a newspaper story extolling the virtues of vacationing in Sri Lanka. When are we going back?

Frank Ogden
21st Century Media Communications
P.O. Box 3608 M.P.O.
Vancouver, B.C. V6B 3Y6
Canada

The last paragraph of the Sri Lanka article says:

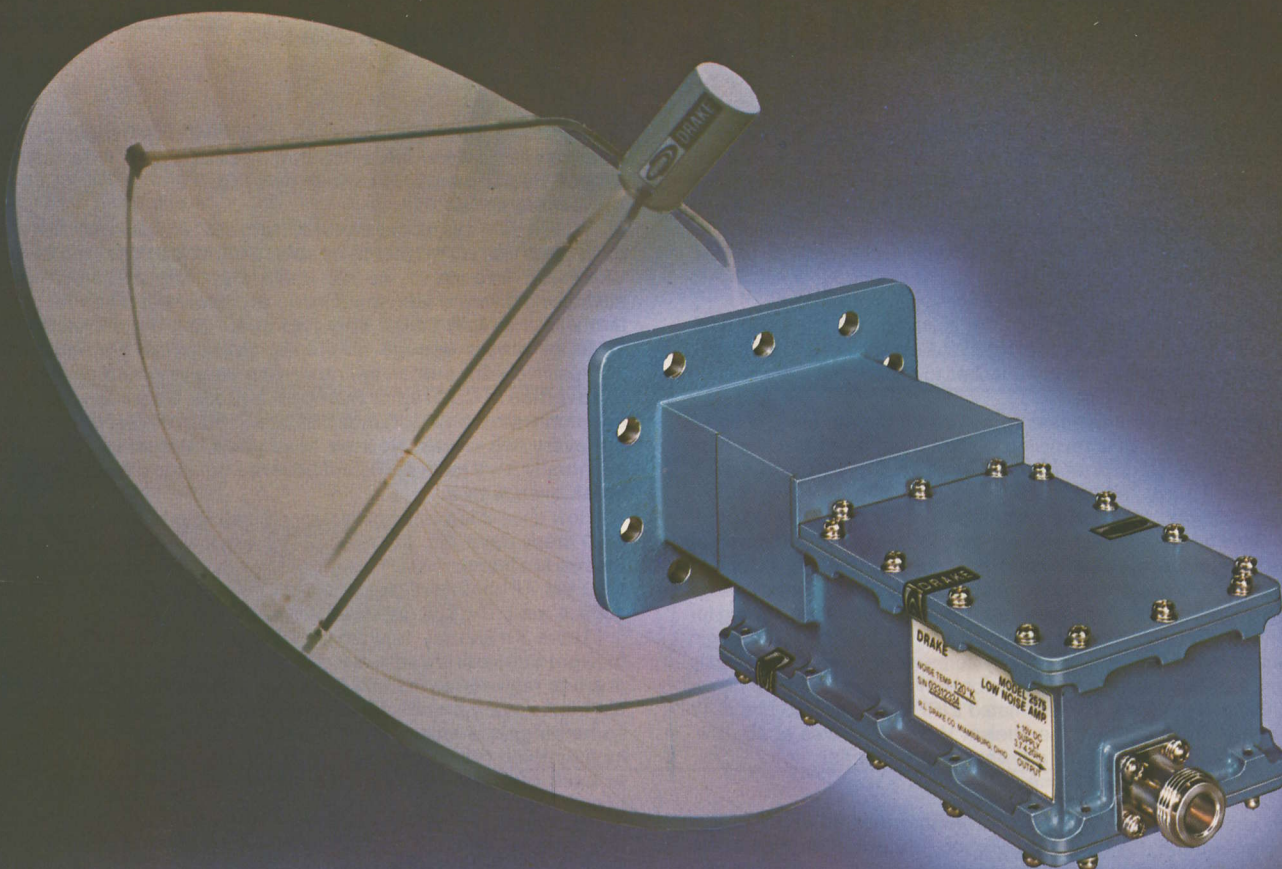
"Those visiting Sri Lanka should have vaccinations for cholera, typhoid fever and yellow fever before arriving. Also, take medication for malaria."

Fortunately, none of those traveling with Frank Ogden and crew last November were afflicted with any local diseases; at least not from Sri Lanka. Bombay, of course, was a different story.

The Philips advertisement states that they are looking for 'TVRO Technical Representatives' to act as 'support for the marketing of satellite receiving systems.' Philips is bringing TVRO gear to Canada for sale, apparently quite soon, and they want the applicants to have experience in 'TVRO site surveys, dealer training, dealer liaison and technical backup to the (new) sales force.' They note that 'exposure to the (existing) TVRO market would be an asset.'

Philips is one of the world's largest electronic firms. Their annual sales are right up there with General Motors in the USA and we all know those are BIG numbers. Their early appearance in the North American market with 'TVRO hardware' is no shocker but it does point up that times are changing.

Of all of the people we heard talk about marketing and selling strategy at the Las Vegas shows, we found Luxor's Hans Giner to be the most fascinating. In a private press conference not open to the public (that was a shame), Giner told members of the press what his firm is doing about cleaning up the TVRO selling act in the United States. The plan is long and very detailed. The bottom line



THE VITAL LINK

LOW NOISE AMPLIFIER FROM DRAKE

The Low Noise Amplifier (LNA) is the vital link in your satellite earth station, and is often required to tolerate the most demanding environmental conditions. The LNA is probably the most electrically-sensitive component in your system. This means you should take exceptional care in selecting the LNA which will maintain the high performance standards you demand.

Drake LNAs feature an integral bandpass filter and ferrite isolator to reject interfering signals and provide maximum efficiency. Each Drake LNA is tested to assure a nominal 50 db signal amplification under all operating conditions. Conservative noise temperature measurements assure you of a LNA which meets its specifications on all satellite transponder frequencies.

Drake LNAs are environmentally engineered to withstand the elements. Every Drake LNA is supplied with an individual performance report of noise temperature and gain parameters. Most of all, Drake LNAs are built with traditional Drake quality and backed with Drake's famous customer support.



Drake LNAs are available in three models to complement your antenna selection, signal strength footprint, and receiver requirements.

R.L. DRAKE LOW NOISE AMPLIFIERS

MODEL NUMBER	WORST CASE NOISE TEMPERATURE	GAIN (nominal)
2575	101 to 120 degree K	50 db
2574	86 to 100 degree K	50 db
2573	85 degree K or better	50 db

Chances are you'll specify a Drake satellite receiver, too! We're dedicated to making your earth station picture sharp and clear. The R.L. Drake Company has produced quality communications products for more than forty years. Demand a Drake!

See your local Drake dealer or contact us for further information.

R. L. DRAKE COMPANY

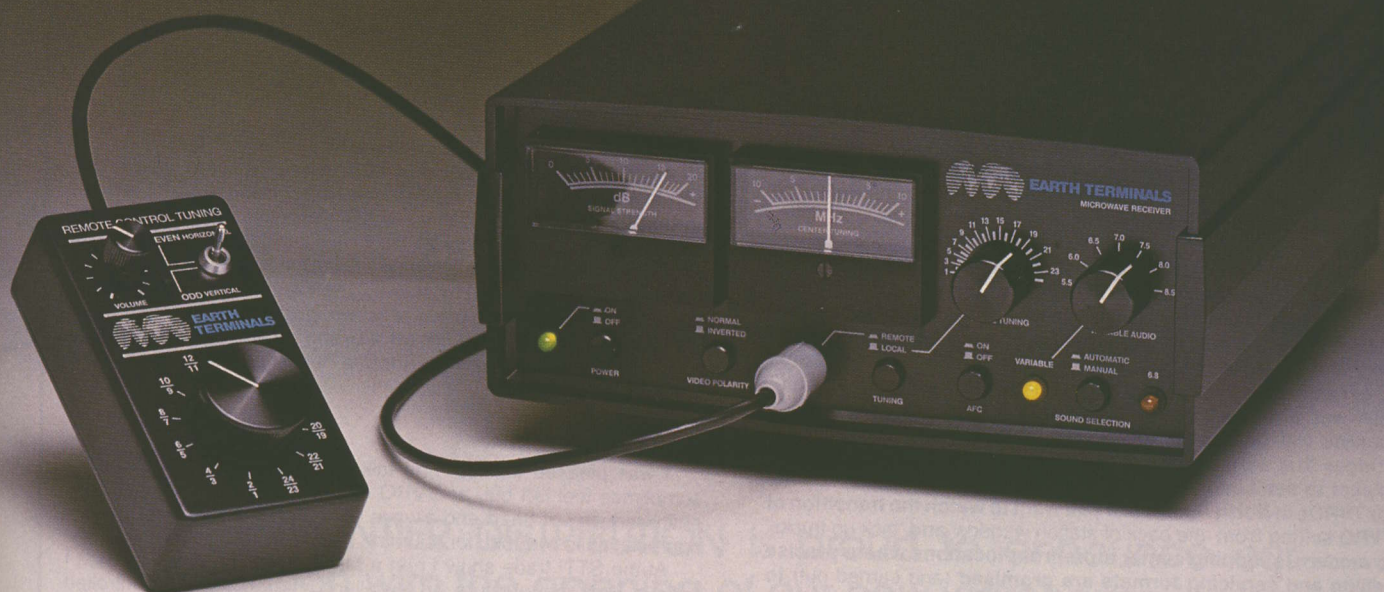


540 Richard St., Miamisburg, Ohio 45342, USA
Phone: (513) 866-2421
Telex: 288-017

PIONEER MEMBER OF
SPACE

© COPYRIGHT 1984 R.L. DRAKE COMPANY

SATELLITE RECEIVER



The true test of a product is its ability to provide lasting satisfaction.

Smooth easy operation and uncompromising video quality have led the EARTH TERMINALS receiver to be called the "Mercedes" of home satellite receivers. Even the most discriminating videophiles find it an impressive performer. Here's why.

Unmatched Video Reproduction

Accurate high resolution video ensures lasting value. Specifications alone can't show the vivid differences in video quality. Compare picture quality before you buy.

Automatic Fine Tuning

High performance AFC provides drift-free channel selection automatically. No "fine tuning" required.

Full Remote Control

25 foot remote control allows easy channel selection and volume level adjustment. (Channel selection automatically selects correct feed polarization.)

Convenient Sound Selection

Eliminates the need to manually select the audio in most cases. System uses fixed (6.8 MHz) and variable (5.5 to 8.5 MHz) audio modules and automatically selects audio subcarriers.

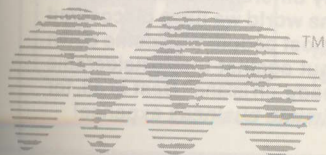
Full Function Metering

Continuous monitoring of Signal Strength (dB) and Center Tuning (MHz). Allows accurate check of system performance (CNR) without additional equipment..

Versatile

Dual conversion circuitry and a remotable downconverter permit multiple receiver systems with a single antenna. (Less sophisticated single conversion receivers require costly interference isolators.)

For more details about our products give us a call or write.



EARTH TERMINALS™

EARTH TERMINALS
Department 103
One Microwave Plaza
Cincinnati, Ohio 45242-9502
513-489-6200

CORRESPONDENCE/ continued from page 51

is that Luxor, little known in the USA but VERY well known in Europe and the middle east and far east, is approaching the US TVRO marketplace at the most professional of levels. We think we know what OEM support for distributors and dealers means here; we do not. Luxor knows what it means. We think we know what a commitment to excellence means here; we do not. Luxor knows what it means.

Giner and crew are entering the field after they had their product brought into the North American market and marketed by American marketing types. Luxor apparently decided that their European brand of dealing was being jeopardized by the American approach to selling their product; and they took steps to get control of their own product back before irreparable 'damage' was done to their European image. The next three to six months will be one of rebuilding their image and rebuilding bridges that were burned or lost to storms. After that, we would expect to see Luxor rewriting the marketing-technique books for TVROs in North America. If you want to watch the transition of TVRO selling from 'the back of station wagons' and 'pick up trucks' to modern, shopping center store front locations where precise selling and servicing formats are promised (and carried out) to customers, watch the Luxor program the latter half of this year.

The Europeans approach marketing with a far greater sophistication than Americans. Most European marketing types are made ill to their stomachs by American marketing antics. That doesn't make 'us wrong' and 'them right'; it merely points up that there are two totally different schools of marketing here and we will have the opportunity to see both at work, and to measure the success ratio of each, in the TVRO field, shortly. Philips, like Luxor, is from the European school. What they do, and how they do it, will undoubtedly cause a few of the existing marketing types to either shape up or ship out.

BIG Footprint Map

From the Island of Antigua, here is some additional information which will help others who are planning TVRO installations in the eastern Caribbean. I am using an ADM 13" dish (12 panels), California Amplifier 80 degree LNA and an AVCOM COM-3 receiver. On Galaxy (1), I get totally clean signals on TRs 4, 6, 11, 14, 15, 19, 20, 23 and 24. Galaxy is but 8 degrees above my horizon. On F3R, I get totally clean signals only on TRs 7, 15 and 19. On Westar 5 I get clean signals on transponders 10, 12, 17, 22, 23 and 24. On Westar 4, the signals are clean on TRs 6, 15, 18, 21 and 23. The only transponder, clean, on Satcom 4 is TR7. The Comstar birds are weak and not watchable.

George Earnshaw
Caribbean Satellite Systems
P.O. Box 1037
St. Johns, Antigua, W.I.

George does complete TVRO installations in the eastern Caribbean and he has learned that service is as important as the initial sale!

GALAXY In The NE

I totally agree with your findings reported in the March issue of CSD concerning Galaxy; the signals ARE weaker on the even-numbered, vertical transponders. There is no doubt in my mind that the signals here on Galaxy are well above those of F3R on most transponders. However, having said that, anyone who thinks he is going to do CBD/DBS in this part of North America must know something that we do not know! Even on a quality dish (10.5 foot in my case) we have complete outages due to snow collection on the dish, or when there is heavy snow or rain across the horizon to the southwest. The look angle on G1 is worse than F3R and the outages we have are damaging enough on F3R that they will be total on G1. How will HBO explain 'snowflake attenuation' to the average consumer? I measured the signal level on the hotter/odd numbered and colder-even numbered transponders on G1 here, and compared the picture quality as well. The bottom line is that the colder — vertical transponders on G1 are actually lower in level here than the powerhouse transponders on F3R (i.e. 7, 15, 19, 23). I am convinced that Galaxy does have a few

problems with their antenna patterns on the vertical side; when do you think they will 'fess up and admit it'?

M.L. Lewis
717 Parkdale Avenue
Ottawa, Ontario
K1Y 1J5, Canada

Possibly never. It does not suit their corporate goals, nor those of HBO, to admit that half of the transponders on G1 are not suitable for 6 foot (or smaller) size dishes. The fact that G1 'sits so low' in the sky, as seen from the populous northeast, is another problem that is probably troubling HBO and the CBD plans. COMSAT is going to 'start up' their service in the northeast and HBO, for corporate pride reasons, probably would like to do the same thing. Do you kick off a brand new program selling C band direct in your one distinctive 'fringe coverage area'? We think not.

NOT A Consultant

I was pleased to meet and talk with Coop at Las Vegas. We sometimes feel left out, as TVRO dealers, but know you have the entire industry at heart and always have the time for everyone. My appreciation is two-fold; for your fine magazine and your availability.

At the STTI trade show I met a Mr. Al Sopel of Viewstar, Inc.; I believe they manufacture an excellent infrared remote controlled TVRO receiver and you may have seen their professional display. Mr. Sopel explained to me that they have a working relationship with Philips/Norelco of Holland. Because there are some questions regarding distributors (etc.) I tried to introduce Mr. Sopel to you. I felt that Coop was the most qualified person to help the Viewstar people get started; but, you had already left for the islands. I am wondering if you would be available for consultation to help Viewstar avoid some of the usual pitfalls of getting started in this business?

Gerard de Blok
SAT-LINK, Inc.
Star Route B, Box 990
Orange Beach, AL 36561

We make it a practice to be as available as possible during trade shows and probably talked with upwards of 250 people about various problems during the SPACE/STTI trade shows. It is a little embarrassing to have a line waiting to talk with you outside your booth or to have to ask somebody to 'walk along with me and talk' while you are making a much-delayed and perhaps painful trip to the restroom! Still, it goes with the turf and we are not particularly generous in doing so; looking at it from our side, we learn as much or more as we pass on and that is one of the key reasons why we are able to stay up to date on what is really happening in our industry. Anyone can talk; it takes a special effort to be a 'good listener.'

Consulting. That means 'Can we talk with you and will you help us with advice, if we pay you?'. We do not engage in consulting. But, we will talk with anyone concerning their problems or questions and if we can help, or if we cannot, the charge is the same. Zero.

Of late we have been getting a steady stream of visitors to the Turks and Caicos Islands; people who come down to learn, and ask questions, and witness with their own eyes what a couple of guys with 22 operating dish antennas at their disposal can do to speed up technology. We suggest that those who have serious plans to market in this industry, and who feel that they can benefit from our experience, first check with Carol Graba in our Fort Lauderdale office (305/771-0505) to see what our schedule might be. We don't put up visitors at the 'annex' anymore unless they are special friends so you will be out the hotel bill, food and the travel costs. The latter just came down, by the way, to under \$200 round trip from Miami on Cayman Air and Air Florida is almost the same. The trip is around 75 minutes or so from Miami and when you step off the plane you are in a totally different world! Provo still happens to be THE BEST place in the world we have discovered to really test TVRO equipment and most people who come down bring gear with them to let us try out against the considerable stack of competitive equipment already 'on island.' Best of all, for business people, the trip is a legitimate business expense!

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Lowrance System 70 receivers truly have no equal for picture quality. Colors are true and vibrant — not that washed-out look so common in other receivers. Lines are clear and distinct — not fuzzy. Low threshold makes 1000-foot runs a snap. And the audio is crystal clear. No wonder that Lowrance, one of the world's finest electronics companies, is proud to put its name on the new System 70 models.

Look over the multitude of easy-use features. With detent tuning, you click right to the channel you want — no fishing around. A polarity push-button with separate skew adjustment makes polarization changes easy and works with the Polarotor 1, Omni polarizer, or a Ferite device. Fixed and variable audio tuning with wide or narrow filter selection makes audio tuning extremely versatile. The System 70 models are equipped with scan tuning, 125 feet of pre-made cables, built-in modulator, AFC defeat and signal strength meter, so installation and antenna positioning are a breeze.

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The System 70^s has all the remarkable features of the standard 70^x, plus superb stereo reception with discreet and matrix capability. The stereo reproduction will please the most discriminating listener, and it's easy to tune with independent subcarrier A and B tuning capabilities.

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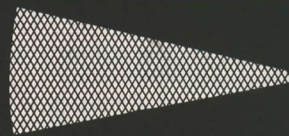
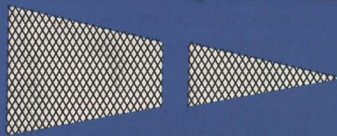
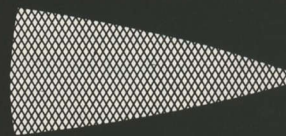
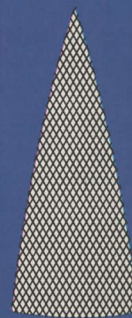
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- Lighter weight than solid metal or fiberglass. Reduced weight means lighter support structure.
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RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P.O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

BASEBALL? Five new services this spring on satellite, all composed of regional cable services. **SPORTS TIME** (F3, TR4) includes Cardinals, Royals and Reds baseball. **New England Sports Network** (F1R, TR17) will carry 90 Red Sox games. **Sportsvue** (W5, TR8) will carry Brewers baseball games (67 in all). **PASS** (W5, TR14) will carry 80 Tigers games. And, **Home Team Sports** (G1, TR12) will feature 80 Orioles baseball games. All plan fall and winter schedules covering football, basketball and hockey. Programming will be slanted towards weekends and evenings.

WOR left W5 on April 12 and is now exclusively on G1 (TR15). WPIX, meanwhile, was scheduled to begin W5 transmissions on May 1 with a slim chance it, too, would end up on G1.

COMSAT, proceeding with plans for DBS, admits that it "must locate a partner this year" or it may be forced to abandon plans for DBS. STC service is scheduled to begin early programming this fall for northeastern USA. RCA, meanwhile, claims they have created a 'tightly-shaped' beam antenna which will concentrate STC's 1986 and after DBS programming over 80% or so of USA to dishes in 2 foot size range.

C. ITOH, the company that brings DX Antenna 4 GHz and 12 GHz receivers into the North American marketplace, has signed agreement with Hughes to 'market Hughes satellites in Japan.' Japanese to date have refused to consider purchasing US satellites, but breakthrough is expected later this year when Japan allows formation of private corporation to own and operate satellites there.

MORE significant action is decision of Intelsat to move recently launched V-F8 bird to permanent location at 53 west, where IV-A bird now operates as domestic relay for Mexico and Chile television. The IV-A bird will 'back up' to 50 west and continue to serve those two countries. V, F8 is just completing tests and should be on station at 53 west shortly after you read this. This bird will become major 'gateway' bird between Europe and USA, with coverage to South America, Africa and near-middle-east as well. With both spotbeam 4 GHz ability (to 34 dBw) and extensive 12 GHz ability, the new bird will become major carrier of inter-connections between Europe and USA. High speed data, private links, network video and network audio circuit loading is anticipated making the 53 west location one of the 'hottest' in the sky, and equipped with all of the latest Intelsat 'gadgets.'

INTELSAT has also decided to 'chop rates' for cable and broadcast TV use; on Intelsat V birds at 53W, 1W and 179E, rates in the \$700K to \$2.1M per year region will apply. On older IV-A birds at 179W and 21.5W, rates drop to \$375K and \$600K for fulltime, 24 hour per day use.

CHILE'S use of global beam transponder on IV-A bird at present 53W (soon to be 50W) not without problems. Tests conducted indicate Chile is running with EIRPs as low as 12.5 dBw because of Intelsat 'back-off' requirements. Chile's TV service uses half (18 MHz) of bird channel while narrow band communications uses other half. Bird is old, and when Chilean TV runs at levels approaching 18 dBw there is massive inter-mod on transponder. One possible solution; Chile will go to full transponder for video and move narrow band services to another 'half transponder.' When problems sort out, approximately 25 TV downlink terminals will be installed to complete satellite-connected national TV network for country.

MAJOR approval from FCC will allow Equatorial Communications

to install 4 foot spread spectrum **UPLINK terminals** for narrow band communications using Westar IV. Data speeds to 9.6 kbps are authorized using vertical transponder 8. Target price for complete 4 foot receive **AND transmit** station will be in \$6,000 region, ready to unpack and install. Exact downlink frequency will be centered on 3.8786 GHz (3,878.6 MHz). Primary use envisioned is direct interconnection between remote terminals and computer mainframes.

YET another applicant to cross over Atlantic with private satellite system; CYGNUS Satellite Corp. wants to serve customers in USA and Europe but throws in two new twists. They would also offer 'international DBS service' as well as 'non-profit communications' to Caribbean basin countries, from two locations at 43 and 45 west.

MARCH amateur boxing held in Reno, Nevada pitted US and Cuban boxers against one another; ABC sports carried. Cuba wanted four hour feed back from Reno for distribution on its terrestrial TV network. Wold set up system which included downlink in Miami off of T1 ABC transponder, land-line carriage north to Jacksonville (Fl.) and then south again on 'international qualified' link of AT&T into Florida Keys where signal was brute-force transmitted across sea into Cuban terrestrial site. There it was tied to Cuban TV networks. Only one hitch; audio mysteriously got cut off in Miami for portion of boxing event coverage and Cubans never complained. Reason? They were taking **direct** feed off of T1 **anyhow**, and the round robin, through Jacksonville and back down to Keys for scatter circuit to Havana, was only 'cover' for their direct lifting from Telstar 1.

GERMAN pay-TV and news service bean on ECS-1 bird April 1. A Swiss pay-TV channel is scheduled to begin similar offerings on ECS-1 this month. In related news, Sky Channels, Murdoch English language commercial service, has signed 300,000 cable homes of Rediffusion in UK.

GTE SPACENET, scheduled to launch first bird late in May on Ariane, wants the former location it had been assigned for bird-3 back. Western Union had gotten emergency assignment of 91W just days prior to abortive attempt to launch W6 and now that W6 has been lost, GTE wants spot back for its own bird; scheduled for launch sometime in 1985.

WESTERN UNION, meanwhile, actively building on Westar 7, has asked FCC for permission to build a 6S bird as a replacement for W7, and then allow the present W7 bird being built to become W6S. If it all works out, W6S or W7, as it is called, could re-launch as early as late summer of 1985.

MAGNUM MICROWAVE, in marketing partnership with Swedish Luxor, has completed a new 47,000 square foot facility in Mountain View, California. LNAs, LNC's and a wide line of 4 and 12 GHz TVRO related units will be built in the new plant.

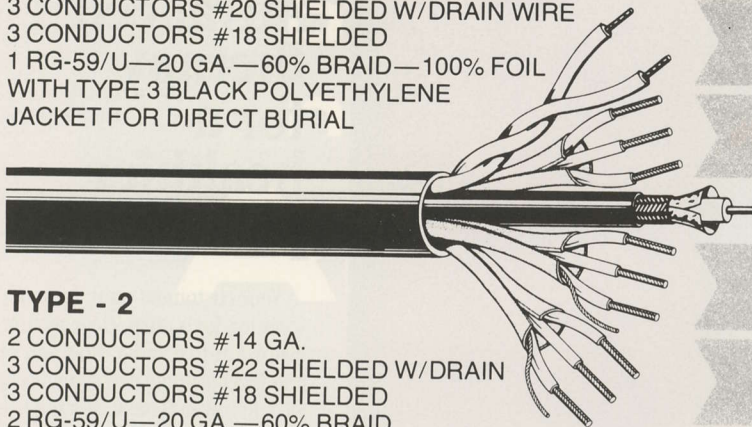
LAUNCHES scheduled through summer, on Shuttle, are being postponed after analysis of best data available relating to failures of W6 and Palapa B2 birds. Apparently failure happened because portions of the exit-cone (through which thruster gases are directed in firing of rockets) came apart within seconds of the start of the 'burn.' This resulted in the birds going into unscheduled orbit and a loss of control. While problems are being sorted out, minor to major shifts in launch schedules are ahead. For example, Delta/PAM rocket sched-

TRANSPONDER WATCH/ continues on page 62

Satellite Total Control Cable

TYPE - 1

2 CONDUCTORS #14 GA.
3 CONDUCTORS #22 SHIELDED W/DRAIN WIRE
3 CONDUCTORS #20 SHIELDED W/DRAIN WIRE
3 CONDUCTORS #18 SHIELDED
1 RG-59/U—20 GA.—60% BRAID—100% FOIL
WITH TYPE 3 BLACK POLYETHYLENE
JACKET FOR DIRECT BURIAL



Motor Arm Voltage
14ga.

Polarotor
18ga.

Signal Line RG-59/U

Down Converter
20ga.

Motor Arm Sensor
22ga.

TYPE - 2

2 CONDUCTORS #14 GA.
3 CONDUCTORS #22 SHIELDED W/DRAIN
3 CONDUCTORS #18 SHIELDED
2 RG-59/U—20 GA.—60% BRAID
100% FOIL
WITH TYPE 3 BLACK POLYETHYLENE
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AVAILABLE IN 330' & 1000' SPOOLS

330 FT. SPOOL @ 54¢ FT.

1,000-5,000 FT. @ 48¢ FT.

5,000-10,000 FT. @ 44¢ FT.

10,000-50,000 FT. @ 42¢ FT.

COAXIAL CABLE

RG-6/U (FOIL & BRAID)	\$ 65/M'
RG-8/U (95% BRAID-FOAM)	\$210/M'
RG-59/U (96% BRAID-PE)	\$ 89/M'
RG-59/U (75% BRAID-FOAM)	\$ 65/M'
RG-59/U (FOIL & BRAID)	\$ 49/M'
RG-59/U DUAL (FOIL & BRAID)	\$105/M'
RG-11/U (96% BRAID-PE)	\$210/M'
RG-213/U (96% BRAID-PE)	\$240/M'
RG-214/U (TINN. COPPER BRAIDS)	\$550/M'
RG-214/U (SILVER BRAIDS)	\$1300/M'
RG-217/U (96% BRAIDS-PE)	\$600/M'

TYPE 'N' CONNECTORS

UG-21/BU (MALE)	\$2.25/each
UG-21/DU (MALE)	\$2.00/each
UG-57/BU (DOUBLE MALE)	\$3.10/each
UG-29/BU (DOUBLE FEMALE)	\$3.10/each
UG-27/CU (RIGHT ANGLE)	\$4.45/each
UG-23/BU (FEMALE)	\$3.00/each
UG-58/AU (CHASSIS)	\$1.60/each
'N' CRIMP MALE	\$2.10/each

MULTI CONDUCTOR CABLE

2 COND. #20 SHIELDED	\$ 65/M'
2 COND. #18 SHIELDED	\$ 79/M'
3 COND. #22 SHIELDED	\$ 75/M'
3 COND. #18 SHIELDED	\$105/M'
2 COND. #16	\$ 80/M'
2 COND. #18	\$ 49/M'
2 COND. #20	\$ 39/M'
3 COND. #22	\$ 40/M'
3 COND. #18	\$ 79/M'
4 COND. #22	\$ 49/M'
4 COND. #20	\$ 69/M'
6 COND. #18	\$135/M'
8 COND. (2-18/6-22)	\$129/M'
8 COND. (2-16/6-18)	\$230/M'

'F' CONNECTORS

F-59 W/1/4" RING	9¢ each or 69/M
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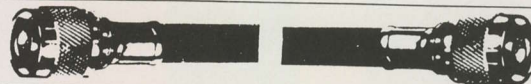
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10 Feet	\$ 9.50	\$ 8.85	\$ 8.50	\$ 7.95
12 Feet	\$ 9.85	\$ 9.35	\$ 8.85	\$ 8.35
15 Feet	\$10.50	\$ 9.95	\$ 9.50	\$ 9.00
20 Feet	\$11.75	\$11.50	\$11.00	\$10.75

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The SR-2. Advanced therapy for a healthier picture.

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The SR-2 contains a break-through ingredient we call LPLL, the Linear-Phase Lock-Loop Circuit. In the past, LPLL has been found only in commercial electronics. But now, LPLL is the key in providing the video demodulation necessary for a brilliantly healthy picture, noise remission and improved threshold performance.

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For happy customers with a healthy outlook on satellite reception, give a dose of the SR-2. It's a totally integrated electronics package, including remote control that's user friendly in operation and installation.

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50°-90° temperature range
[75° typical or better]

frequency range:
3.7 to 4.2 GHz.

gain:
37 dB [min], 40 dB [normal]

voltage:
+14v to +23v @ 60 ma. [max]

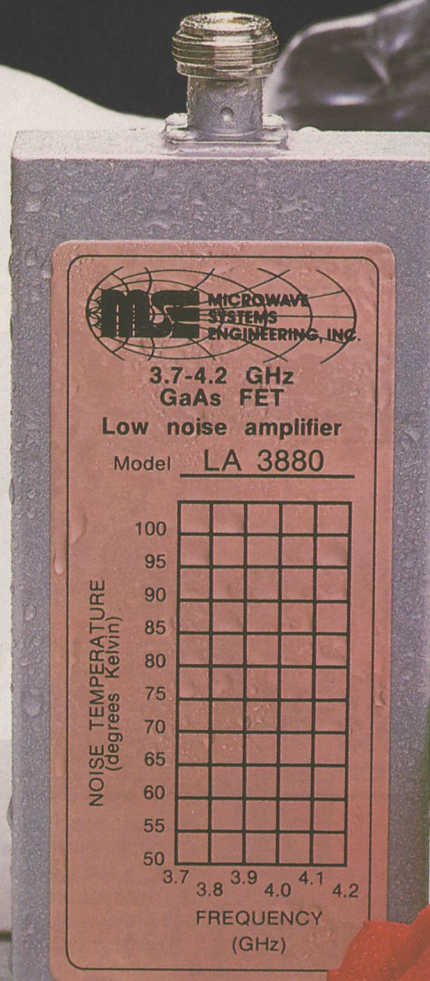
RF input flange:
CPR 229G waveguide

RF output:
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operating temperature range:
-40 °c to +60 °c

weight:
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warranty:
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UNTIL NOW!

TRANSPONDER WATCH/ continued from page 58

uled to carry Galaxy 3 will move from late May to late July, or after. Telstar 3C will move back month or more on Shuttle, to around 1 September. Canadian Anik Bird, scheduled for launch mid-June, will slip to undetermined date. End of year could see severe crowding of launch calendar to make up for lost months this late spring/early summer.

INSURANCE underwriters continue nervous, meanwhile, with some **expecting** another major loss this year before the technical problems sort out. Insurance rates have jumped by 10% and more, and no end is in sight.

LONDON Financial Times newspaper wants to establish a satellite-fed US edition to be printed in New York City.

FINANCIAL News Network, meanwhile, has switched to F3R and daytime use of TR4 after foldup of Spotlight service. Nighttime service on TR4 is for Sports Time service.

USIA will install downlink terminals and possibly some uplink (audio) terminals as well at more than 40 embassies over next 15 months. In a COMSAT sponsored demonstration, new 'compressed video' technology was displayed allowing full motion video to be transmitted in relatively narrow (1/10th of transponder) bandwidth.

COMSAT's STC 12 GHz DBS program may have major announcement to make in video scrambling field this summer. Tests of totally new video scrambling technique, using proprietary technology developed in Comsat Labs, is getting them closer to making major announcement.

SCIENTIFIC ATLANTA had 30% better quarter and is making money again. S-A is continuing to push hard at 'mini-cable' marketplace, their term for 'SMATV.' Firm is also facing major 'unionization effort' and apparently has been 'targeted' by IBEW for all-out union effort during balance of year.

NEW Soviet Ekran satellite, direct television broadcasts to eastern Russia, launched in mid-March.

FRENCH say their TDF-1, DBS bird, which is part of a joint-

venture with (W.) Germany and their TV-SAT bird, is on schedule. It is planning an October 1985 launch. The German portion of the duo has not yet confirmed a launch date.

KOREAN manufacturing based KEYTRONICS displayed at Las Vegas shows and is now entering home TVRO field with down converter plus receiver package that prices to TVRO dealers in the 'under \$350' region. An LNA is planned.

TDRS-B won't launch now until mid to late spring of 1985, and the 'C' version of series will not launch before late summer of next year.

CANADIAN Telsat carrier is inching transponder rates upward, now at 5.5% per year, and says it hopes to recover money it lost operating ANIK system to date.

TELETEXT/ a new source for national Teletext service may be available via PBS feeds on Westar soon. Testing now going on sponsored by brokerage house Merrill Lynch is checking on feasibility of delivering financial information to customers and affiliated offices. If tests work out, the service would begin sometime in 1985.

SHUTTLE problems abound, the satellite launch rocket motors aside. Reports indicate that parts which had been forecast to last through as many as 50 launches are wearing out in a single launch, and replacement parts are being removed from active Shuttle birds to keep schedule going. They may not be successful; June Shuttle mission apparently will slip at least two weeks because of a parts shortage.

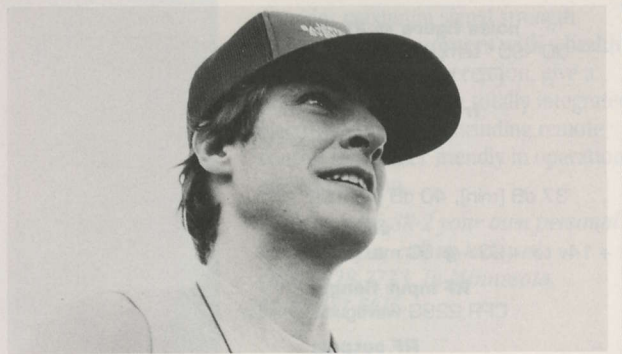
TED TURNER made money for first time since 1979 when he started up CNN; put around \$5.2 in his own pocket during last fiscal year.

GORIZONT satellites in USSR system now being used to transmit Pravda national newspaper text to 'remote printing centers.'

UP and down. USCI 11/12 GHz service first raised its rates to \$995 for dish system purchase, and then abruptly dropped them to special March-only price of \$750. Rates have also been cut to \$34.95 per month. Reports that they are averaging close to 7,500 new installs per month, primarily in Baltimore/Washington/Philadelphia area cannot be confirmed.

SCPC ACTIVITY REPORTS

Conducted By Marshall Foiles/VP5M



BASIC Data

Those who are readers of **CSD/2** will recall reading a piece detailing how narrowband data and audio circuits function on satellite; appearing in the February 1984 issue. We assume you have this background at this point.

A single satellite transponder can carry into your home a video program and one or more sub-carrier audio programs. Or, it can carry dozens, even hundreds, of 'narrow band' voice, audio or data channels. A single video picture occupies about 75% of the space available on a transponder (the room left over is used by the audio sub-carriers, or it is not used at all). A single audio channel can occupy as little as 1/9000th of the transponder. For various reasons they don't elect to cram 9000 voice or data channels into a single transponder, but in theory it could be done. The importance of the numbers is this:

You can trade as many as 9,000 narrow band information channels for one video information channel. Obviously there are some businesses and some people who would find that trade attractive.

You receive these narrow band transmissions with a narrow band

receiver. Your TVRO receiver is a 'wideband' receiver designed to snare all of that wideband video information. Your audio sub-carrier tuner, or the special outboard tuner such as USS/Maspro, Arunta or Drake offers, is a 'sub-receiver'; it works off of the basic video receiver and without the basic video receiver it is not capable of doing much.

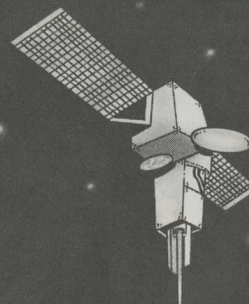
Sub-carrier transmissions are fascinating and we'll deal with them from time to time here. However, they are not our main thrust since they are primarily created in the same mold as HBO or other 'mass appeal' video transmissions and we have to assume your interests or your customer's interests go further than mass appeal programming.

A sub-carrier transmission may be as narrow as 100 kHz or as wide as 400 kHz (plus). Many of those found on F3R, TR3, buried behind WGN, are in the 100 kHz width region. Disney audio is an example of one that has elected, for 'high fidelity reasons,' to be wider than most (approaching 400 kHz). The Intelsat AFRTS feeds going to Europe/Africa at 1 west or to the Pacific on 179 east are an example of extremely wide 'sub-carriers'; being in the 750 kHz width region.

The narrow band transmissions we deal with here are truly **narrow band**; some are barely 4 kHz wide! That makes them tiny little fellas tucked away in a gigantic transponder where even 100 kHz wide

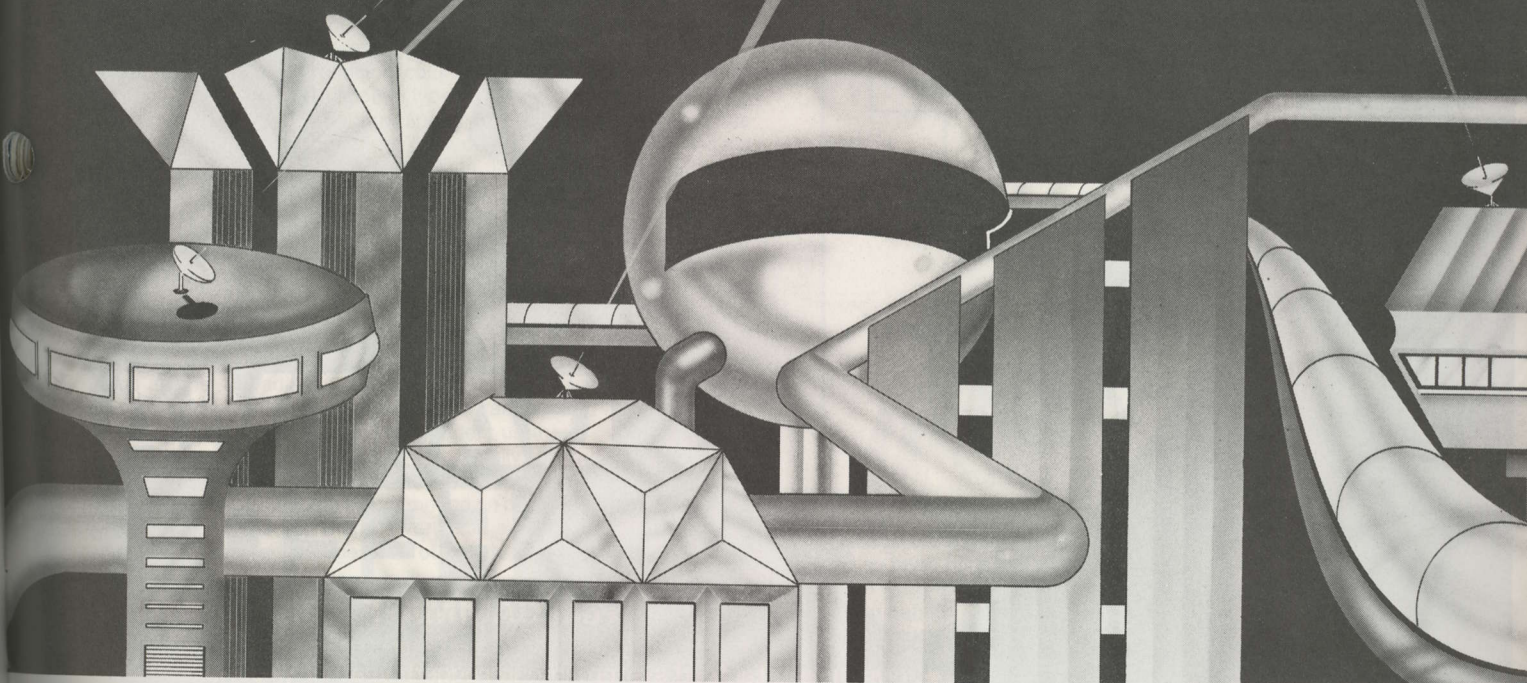
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sub-carriers are sometimes overlooked. But the information they contain may well be just as interesting, and just as 'informative,' 'educational' or even entertaining as that found on F3R, TR3.

The 4 kHz transmissions are called **SSB/SCPC** because they use a modulation format known as single sideband (SSB). To tune them in you have to first down convert your TVRO signals to your standard 70 MHz IF, tune in the appropriate transponder on the appropriate bird (that's what our 'listings section' is all about!), and allow your standard, existing TVRO video receiver to demodulate that transponder. Now what you will see or hear on your TV set, having done this, is **not video** and there will be **no audio** (although on some transponders, especially on Comstar birds, you may hear a 'crackling' sound that acts like it is trying to be audio). That's where the special techniques come in.

Now you connect the **video** output on your TVRO receiver (I did say video) to the input on a communications receiver. A Kenwood R-1000, ICOM R-70 or a JRC-515 are in the proper 'family' of receivers for this task. If you have a choice, you should find an output spigot on the back of your TVRO receiver which has **unfiltered video** in it. Unfiltered means that they have not 'rolled off' the upper portion (which normally contains the sub-carriers) with filters inside of the receiver. We want ALL of the video passband (from 0 to 8 MHz or more) rather than just that portion between 0 and 4.5 MHz (which normally carries the video part of the signal) since on an SSB/SCPC transponder it may well be 'loaded' with narrow band channels all the way to 8 MHz and above.

This 0 to 8 MHz 'bandwidth' coming out of the TVRO demod is a miniature frequency spectrum all to itself. It is a world alone and inside of it may be hundreds of audio and data channels just waiting to be discovered by the explorer!

Since this is an introductory column, we'll save the 'techniques' for a later visit. Let's look at another type of narrow band data; FM/SCPC.

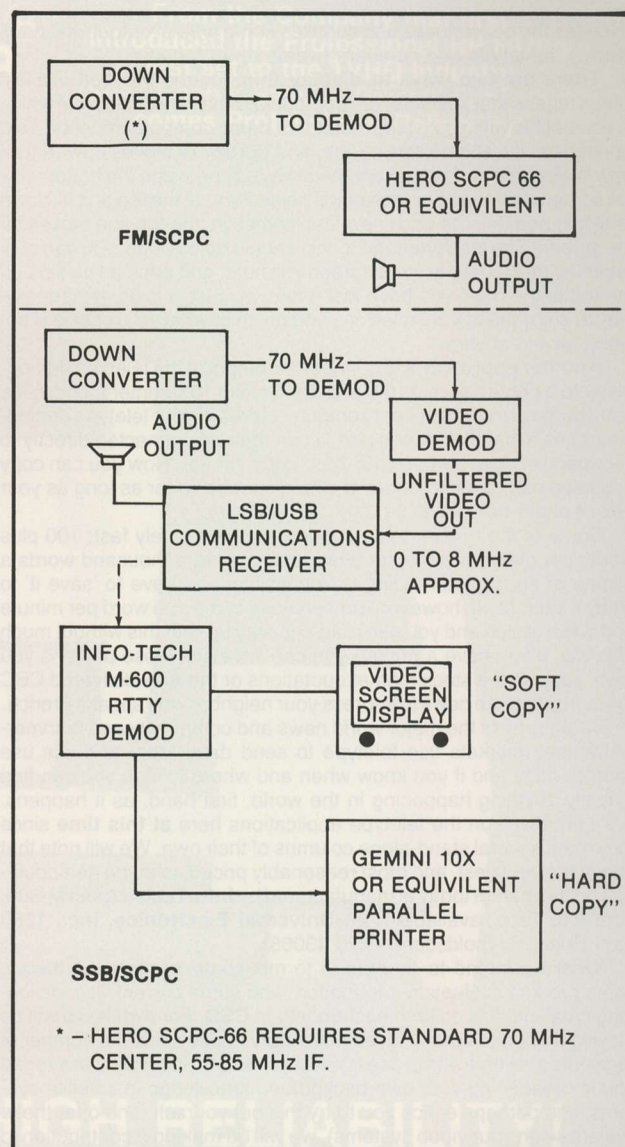
SSB/SCPC is fine for slow speed data (say up to 300 baud rate maximum and more typically 170 baud), and, human speech. It is not so good for music and high speed data. There is simply not sufficient 'bandwidth' to support the greater range of baseband audio frequencies we find with music, or the bandwidth required for fast data (300/1200 etc. baud). So a second technique for sending 'narrow band' data via satellite was developed; **FM/SCPC**. This is typically a 60 kHz wide service and the 60 kilohertz wide channels are spaced across a transponder at roughly 200 kHz intervals. If a transponder can be useful to a bandwidth of 36 MHz (36,000 kHz), then we could in theory have 36,000 divided by 60 or 600 such channels if each butted up against the adjacent channel(s). At 200 kHz spacing, the more practical limit is 180 such channels per transponder. That's OK; there are lots and lots of vacant transponders up there!

We are going to concentrate, initially, on the FM/SCPC services because they have the greatest variety of informational, educational and entertainment programming on board. That's the plus side; the down side is that there is very little equipment currently on the market to take advantage of all of this data!

We have talked with a number of receiver suppliers who find the wide range of data and information channels interesting. We have been promised that within the next six months there will be several new FM/SCPC receivers on the market and perhaps in those there will be the special receiver which you would like to have in your own system, or which you would feel comfortable offering to your TVRO system customers who want more than just 'Captain Video' from their TVRO system.

(Note: At the present time the **only** commercially available FM/SCPC receiver available in our industry is offered by **Hero Communications**, 2470 W. 8th Avenue, Hialeah, FL 33010; 305/887-3203. Their **SCPC-66** receiver is designed for recovering the 60 kHz wide FM/SCPC signals which we will be reporting on here.)

The basic narrow band receiver (whether FM or SSB) produces an audio 'message' to you via the speaker. That audio message may make sense to you (i.e. be intelligible), or, it may sound like gibberish. The gibberish, if it has the sound of 'musical bells' or tones, is probably some form of radio teletype. Radio teletype (RTTY) is the international teleprinter system which allows a text message made up of words and numbers to be transmitted from one location to another. A teletype machine may be made by one of several firms and the name Teletype® should always be followed by the notation ® since it connotes a



registered trademark of The Teletype Corporation. We will use the word so often here that we'll simply make that notation from time to time to keep the people at The Teletype Corporation happy!

You can listen to what teletype sounds like by tuning your TVRO receiver to transponder 12 on F3R (Showtime) and dialing your audio sub-carrier tuner to **just below** the Showtime audio. There you will hear a strange sound and that sound is Teletype. What are they sending?

Showtime has operated a 'text service' for some years, sending out 'show business' shorts; news items about stars, new movies and so on. Some cable systems use this in their cable support channels to entertain and inform subscribers. There is no other comparable service on F3R and this one alone does not justify purchasing the **teletype demodulator** unit.

What is that all about?

Teletype is a system of codes; either something called the Baudot Code or the ASCII code. It is akin to (but not similar to) Morse Code. Each letter, number and punctuation mark has its own code and when the operator strikes the key for T on the machine that code is transmitted. It has a 'musical sound' as do all teletype characters. The code is transmitted, and then received by a gadget called a 'teletype demodulator.' Since these are audio tones, you interconnect your teletype demodulator to your satellite (audio) receiver so the tones you hear are fed into the teletype demodulator. Then the demodulator

decodes the coded tones and supplies some type of output which will display the letters and numbers (words et al) for you.

There are two ways to display this. One is the 'soft display' which means that your teletype demodulator has a video output which is compatible with your video monitor or home computer monitor. Text appears on the screen, line by line, and 'scrolls' or moves upwards as new lines come in. The current line always appears on the bottom of a full screen (although the screen will begin filling at the top and fill down until full) and then as each new line 'comes in' the top line moves off the screen. The disadvantage to this should be obvious; you can only retain as much data as your screen will hold, and once a line flips off the top of the page you have lost it forever. Still, it is an inexpensive way to enjoy these transmissions and much of what you receive is not worth saving anyhow.

Another approach is to connect the output of the teletype demodulator to a printer; such as the popular Gemini 10X printer found in the \$300 range at many discount computer stores. If your teletype demodulator has a 'parallel output' port, it can then be connected directly to your parallel input port on your 'hard copy' printer. Now you can copy and keep permanent records of what you receive for as long as your box of paper holds out!

Some of the transmission speeds are moderately fast; 100 plus words per minute. Some are even faster, up to a thousand words a minute or so. Speed reading is impossible; you have to 'save it' to study it later. Most, however, lumber along in the 100 word per minute and down region and you can read and stay up with this without much difficulty. If you have a printer, you can save just those portions you wish, such as the stock market quotations or the Anik delivered CBC French Language news to impress your neighbor who speaks French.

Virtually all of the major world news and commodity and commercial money markets use teletype to send data. Most of these use satellite relay and if you know when and where to look you can find virtually anything happening in the world, first hand, as it happens. We'll not dwell on the teletype applications here **at this time** since they merit several stand-alone columns of their own. We will note that one of the very best, and most reasonably priced, teletype demodulators on the market today is manufactured by **Info-Tech** (Model M-600; from Info-Tech, available from **Universal Electronics, Inc.**, 1280 Aida Road, Reynoldsburg, Ohio 43068).

What we intend to do here is to mix some background theory, some product evaluation information, and some current 'listings/logging data' into this column each month in **CSD**. For awhile we will be playing a popular tune to an almost empty house since the number of receivers available and in use is relatively small. Still, if we can interest you in broadening your own background knowledge in satellite systems, and perhaps entice you to try this out yourself (and offer these systems with your video systems), we will be making a contribution to your own business activities in this field and better preparing you for the changes in satellite communication systems ahead.

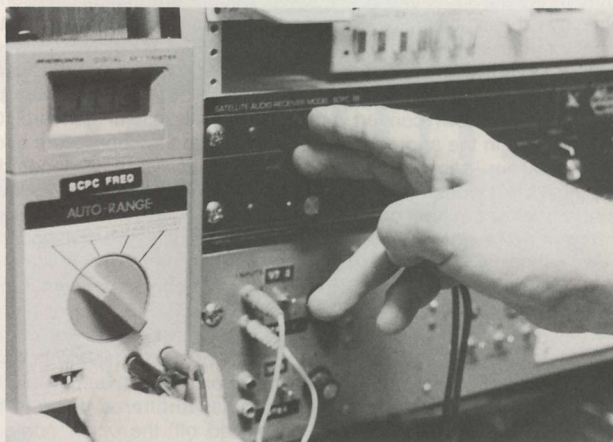
A Starting Place

The Hero SCPC-66 receiver is not really intended for the casual listener to FM/SCPC. This is a non-user-friendly receiver intended for permanent installation in a commercial or semi-commercial installation. Its primary failing (the price aside) is that the user has no built-in way of determining **where he is within a transponder** as he tunes that 36 MHz wide channel logging first one service and then another!

This presented us with two problems:

- 1) We needed to know where we had found various services so we could return to them from time to time, to check on them, and,
- 2) We needed to tell you not only which transponder, but **where within the transponder** to tune, to find those services. If you are a Seattle Mariner fan in Florida and you want to find their baseball games on Westar 4, audio FM/SCPC, it would help if we could tell you **where** to look!

*) Limited numbers of the **February 1984** issue of **CJR** (our forerunner to **CSD/2**) containing our report on the Hero SCPC-66 receiver are available free for the asking. Call CSD at 305/771-0505 or write Carol Graba, CSD, P.O. Box 100858, Fort Lauderdale, Florida 33310. **Ask for CJR, February.**



HERO SCPC 66 receiver tuning knob (indicated) and the digital 'tuning meter' that began life as a Radio Shack 'Auto-Range' digital multi-meter.

Without a 'tuning dial' we were up a creek.

Here is what we have done, and this will be the basis for our own logging charts **until** we receive one of the first generation FM/SCPC 'consumer grade' receivers which has been promised to us by the manufacturers who are presently addressing this very problem.

We went inside of the Hero SCPC-66 receiver and located the back end of the tuning pot. This is the knob you tune to change FM 'channels' inside of the transponder after you have dialed up the transponder on your TVRO receiver. The TVRO receiver establishes the transponder; the SCPC-66 establishes, with the tuning knob, where within the transponder you are tuned.

On the Hero SCPC-66, we found two leads on the back of the tuning control pot. There we found that there was a tuning voltage which changes as you tune the knob. You could connect a simple digital multi-meter (VOM) to these two contacts and measure (as in monitor) that tuning voltage as you tuned the tuning knob. If you then recorded (wrote down) the voltage displayed on the digital multi-meter as you tuned in each 'station,' you had a way to return to that station by simply redialing the tuning knob to the same voltage reading previously recorded. This is what we did and while this is a custom system, you can be sure that it will be replaced with a **real** tuning dial read-out as soon as the first now-in-development home style commercial receivers come on the marketplace. Pioneers always have it rough!

This Month's Listings

The following listings show where you will find FM/SCPC services using a 60 kHz wide FM demodulator system such as the Hero SCPC-66 receiver operating as outlined here. Not all services are fulltime, indicating that they may maintain either irregular hours, or only operate for a portion of each hour. Designations are as follows:

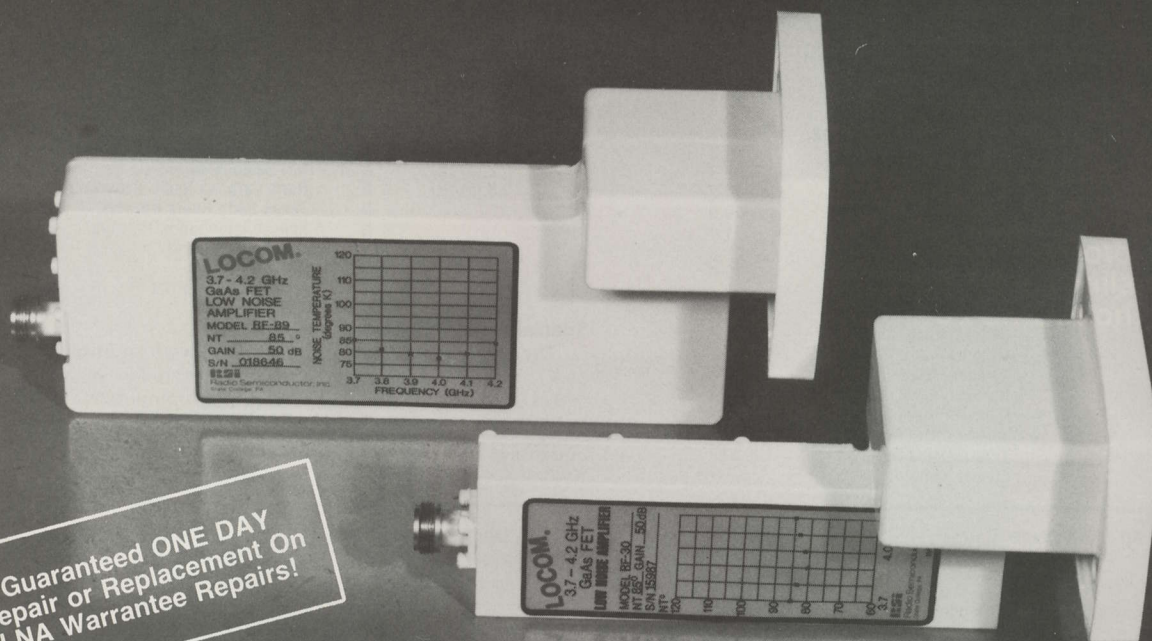
- 1) **N** = not full time;
- 2) **MN** = MAY not be full time (i.e. subject to additional verification)
- 3) **S** = scheduled times, example given
- 4) **SE** = special events, such as baseball network coverage only
- 5) **22.3** = example only; indicates voltage-tuning position of SCPC-66 receiver (see text). Generally speaking, a low number (such as 4.0) indicates signal is on higher portion of transponder (i.e. above 70 MHz center) while a higher number (such as 22.3) indicates signal is on lower portion of the same transponder.

Many transponders have unmodulated carriers present, either full time (i.e. they have NEVER been heard with audio or modulation) or the carriers present, either full time or part time, are simply acting as beacons to keep network receivers 'up' in between normal transmissions. For example, if Mutual Radio News feeds newscasts at 00, 15, 30 and 45 minutes reference the hour (i.e. 12:00, 12:15, 12:30, and 12:45), and the newscasts last 5 minutes each, you will find the carrier 'up' full time (all 60 minutes of the hour) but audio programming (modulation) only between 12:00 and 12:05, 12:15 and 12:20, 12:30

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and 12:35, and 12:45 and 12:50.

Our table this month will deal ONLY with those services which have an 'identity'; that is, if there are carriers or services which have not yet been identified, they will not be listed at this time. More than 200 such 'carriers' have been found, with the present ratio of 'identifications' running around 30%. This will improve with time.

Satellite	Transponder	Designation	Service/Description	Tuning Voltage
F1R	15 (V)	MN	Voice Of America	28.3
W4	1 (H)		Mutual Radio	10.5
			Mutual Radio	19.8
			Mutual Radio	20.0
	2 (V)		National Public Radio	0.06
			National Public Radio	0.45
			NPR/Handicapped Radio	1.1
		N	Georgia Radio News	2.3
		N	Georgia Radio News/WGST	2.7
			National Public Radio	8.7
			Mutual Radio	27.2
	3 (H)	N	US Navy/Master Clock	3.4
		N	Minnesota Radio Network	4.8
			National Public Radio	8.8
			Mutual Radio/Lifestyles	9.3
			Mutual / News & Sports	10.2
		N	Minnesota Radio News	10.6
			National Public Radio	11.4
		N	US Navy/Master Clock	12.0
		MN	In Touch/Blind-Deaf Net	12.4
		MN	In Touch/Blind-Deaf Net	13.6
			National Public Radio	13.8
			National Public Radio	14.1
			National Public Radio	14.3
			National Public Radio	17.6
			National Public Radio	18.3
			National Public Radio	19.7
		N	Texaco Opera Net	20.1
		N	Texaco Opera Net	20.7
		N	Mutual Radio/ Advisory	21.7

4 (V)	N	Georgia Radio News	22.0
	N	Georgia Radio News	22.5
		Mutual Radio	24.0
	N	IMS News/Washington, DC	28.0
	N	Alabama Information Net	28.2
	M	US Navy/Master Clock	21.5
		National Public Radio	26.8
		Mutual Radio	27.3
		Mutual Radio	28.3
		N	Minnesota Radio News
1 (V)		Mutual Radio	29.0
		National Public Radio	29.5
	N	US Navy/Master Clock	30.0
	MN	In Touch/Blind-Deaf Net	30.4
	MN	In Touch/Blind-Deaf Net	31.6
		National Public Radio	32.5
1 (H)		Mutual Radio	10.5
		Mutual Radio	19.7
		Mutual Radio/Advisory	20.0
2 (4) (H)	N	UPI Radio News	12.0
		(English & Spanish)	
	N	AP Radio News	18.3
	N	Wall Street News	20.6
3 (5) (H)		(on the hour reports)	
	N	UPI Radio News Net	9.3
	N	North Carolina Radio Network	9.7
	N	Texas State Radio Network	18.0
	N	Kansas Information Network	22.0
		ABC News Network	23.5
		UPI Radio News	28.9
	N	Trans Star Radio Net	32.2

Special Notation of the month:

The Los Angeles Dodgers baseball network, in **English**, is found on T1, TR1 (V) on a standard sub-carrier (tuneable with most receivers) of 6.9 MHz. The same game coverage in **Spanish** is found on 6.0 MHz. Happy Dodgering this month!

Next month, the 'list' grows, plus, a preliminary look at major sources for SSB/SCPC services.

COOP/ continued from page 5

told us that they would prefer to see the 1934 Communications Act 'amended' since it contains all of their 'marching orders' from Congress. In fact the 1934 'Act' established the FCC, and from that 'Act' everything the FCC has done or does today is supposedly founded.

The 7 PM inter-link between Las Vegas and Washington, DC, spread out over the big screen displays in Vegas, attempted to explain just how important new legislation would be for the healthy growth of the industry. On the telecast we had General Counsel Richard L. Brown, Senator Barry Goldwater, and some Congressmen. They told us the following:

- 1) Two new pieces of legislation had been drafted (by Brown and Finn); one was being introduced in the U.S. Senate by Goldwater (S.2437) and the other was being introduced in the House by Congressmen Gore, Tauzin and Rose (HR.5176).
- 2) The Senate Bill creates a set of language which clearly defines what the 'viewing rights' would be for home TVRO owners/viewers. In presenting his bill to the Senate, Goldwater said (on March 19th):

"I am today introducing legislation to reaffirm in statutory law what I believe to be the correct interpretation of existing law; the right of individuals sitting in their own homes to receive satellite television signals and to view the programming offered by such signals, where such viewing is strictly for noncommercial purposes . . ."

He went on to state:

"The Communications Act of 1934 is silent on the question of noncommercial home reception of unscrambled satellite programming. Some argument has recently been raised, however, to challenge the right of individual Earth station owners to view these programs on the grounds that section 605 of the Communications Act may prohibit the reception and use of satellite broadcasts. I reject this argument as

being entirely wrong."

Goldwater goes on to state that any 'interpretation' of the law, contrary to his beliefs, would (he feels) come from the courts. He wishes to avoid allowing this entire question getting 'to the courts' and he foresees that if Congress adopts S.2437, then there will be a clear-cut 'approval by Congress' for home TVROs to receive unscrambled transmissions. This in turn would avoid a court suit; something we would all favor.

- 3) The other bill, introduced in the House, goes one step further. It is one thing for Congress to approve home satellite terminal use (by 'codifying' the existing 1934 Act, through passage of a law that 'clarifies' that act); it is quite another for a premium program supplier, such as HBO, to scramble and then **NOT** allow home TVROs the opportunity to subscribe to the (scrambled) transmissions. HR.5176 would deal with that issue.

The idea is that if HR.5176 becomes law, there will be a legal mechanism in place which would **force** HBO (et al; actually, any cable programmer who scrambles) to allow private TVROs to subscribe to the scrambled services, receive decoding equipment for that purpose, and pay a monthly/annual/lifetime fee for the use of that (scrambled) service. They entitle this bill 'The Satellite Television Viewing Rights Act of 1984.' The act would authorize the manufacture, sale, distribution and importation of decoding devices provided those engaging in such activities limited their sale/rental/leasing of such equipment to individual (private) homes where non-commercial viewing was taking place, and, where the home TVRO viewers had agreed to pay for the services.

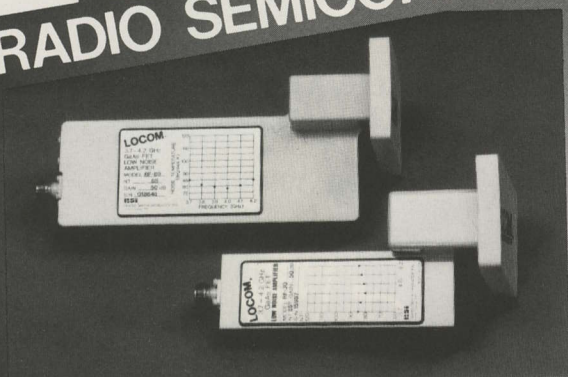
Now, the clever part. Suppose the HBO decided it did not want to REALLY go along with the act, but it did not wish to be in violation of the act. Remember, the act will 'guarantee' the right-to-view to home TVRO system owners. One of the easy ways HBO could comply, but avoid having to **really** deal with home TVROs would be to set the rates so high that nobody (well, almost nobody since there are a few who can and would pay **any** fee set) can afford the service. That may sound far-fetched, but it is certainly a possibility nonetheless.

HR.5176 would establish a procedure whereby if some scrambled programming service provider decided to jack the rates up out of sight,

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the FCC (remember them? The Federal Communications Commission; the same people who declared home TVROs 'free' of regulation in October of 1979!) would step in and 'set' rates. HR.5176 would allow the FCC to:

"... establish reasonable rates, terms and conditions (for such) viewing rights ..."

This is clearly an incineration issue; it will (and in fact already has) attracted plenty of 'fire.' As you might suspect, the cable people are not overjoyed with the prospect of being 'forced' to sell their premium/scrambled programming to private TVROs. Early comments from national cable personnel have been someplace between "no way, José" and "not in our lifetime ...". In other words, they intend to fight this bill in Congress.

Which brings me to the reaction I heard, over and over again, in Las Vegas after the 'Big Surprise' telecast on March 19th.

First of all, this is not a new concept. Richard L. Brown has been carrying the legal language for both of these bills around in his briefcase for nearly two years. He is a smart practitioner of Capital Hill politics, in spite of what some may believe, and he knew that the timing of this was critical. The first step to get the timing in line was the creation of a working dialogue with both Senate supporters, and, House supporters. We needed someone to run with the ball on both sides. Goldwater, after the ovation in Orlando last fall, was the obvious first choice in the Senate. That he is the 'senior member' with experience in communications also does not hurt.

The House side has been 'in line' for a longer period of time; Congressmen Tauzin and Rose have been friendly towards our industry for several years and Gore, after the staging of the Nashville show in his home state last fall, has been very interested in what we are doing.

The reaction I heard followed these lines:

A) **'Why didn't we introduce the same bill on both sides?'**

The answer to that one is 'strategy.' The Goldwater introduced bill is far easier to swallow; it only deals with 'viewing rights.' It does not attempt to FORCE scrambled programmers to deal with individual home terminals. If the House bill gets bogged down in hearings because the cable folks can't accept it, and it is stalled in Congress, a 'compromise' might be struck to allow the Senate bill to go ahead anyhow. That would get us **some freedoms** (i.e. nobody would be hauling home TVRO viewers into court for watching unscrambled programs), and it would 'buy time' to work out the more complicated 'forced viewing rights' for the scrambled folks.

B) **'Won't the adoption of HR.5176 speed up the scrambling process; won't premium service programmers, if HR.5176 goes through, see it as a way to finally get some bucks out of scrambling, and won't that make them scramble sooner?'**

It probably will have the effect. On the other hand, there is a trade here that is very important; if HR.5176 is passed, we will then and forever be guaranteed the right to view scrambled programs and that will settle, once and for all, the 'piracy' issue.

C) **'What about the network programs; are they not planning to scramble as well?'**

The networks do plan to scramble. Network service is NOT included in this package. Only those services which are intended for "... reception by cable television subscribers ..." are covered. That means that network programs will NOT be available, scrambled, to individual TVROs.

D) **'If network programs are not included, and there are many home TVRO viewers who receive their only network service (1 or more networks) via satellite, won't they be losing an important service for which there is no substitute?'**

They will. Brown and Finn apparently did not realize the importance of network viewing via satellite to many TVRO owners, or, they felt that if the networks were also forced to serve individual homes in this manner, the networks would try to scuttle the bill. There is no point in taking on the cable people **PLUS** the networks, in Congress, if you can avoid it!

E) **'What about those who live outside of the United States, but who receive their service from US domestic satellites?'**

Neither S.2437 nor HR.5176 address this issue. US law (i.e. the



SPACE/STIA Prexy Dalton before the big-screen inter-connect to Washington.

rewording of the 1934 Communications Act) pertains to US citizens, **living on US soil**. There is no way legislation adopted by the US Congress can pertain to US or other citizens living outside the USA unless the country in which they live agrees to the terms of the legislation. Sorry.

F) **'Is this ONLY 4 GHz legislation?'**

No specific frequency is mentioned in the proposed legislation; it would pertain, if the same principles applied, to 11/12 GHz or any other satellite television 'band' that might be opened in the future. However, the thrust of HR.5176 is to deal with programming services intended specifically for "... **cable television system subscribers** ...", so the so-called viewing rights only extend to those services. S.2437, on the other hand, appears to deal with virtually any unscrambled programming, received by a private terminal and used for non-commercial purposes.

G) **'How will this legislation impact on the local zoning rights issue?'**

If S.2437 becomes law, it will strengthen the arguments which must be made at the local level regarding the 'legality' and 'intention of Congress' concerning viewing of 4 GHz signals. S.2437 does not **directly** address zoning, although it could still be modified to include that provision. That is another 'strategy' question which the industry will have to face.

H) **'What are the REAL chances of this legislation passing?'**

The cable people are already reacting and they don't like what they see. Ed Dooley, speaking for the National Cable Television Association, is quoted as saying, "It's a novel approach that will undoubtedly be opposed by cable operators and will undergo extensive and detailed scrutiny by Congress." The use of the word 'novel' suggests that the NCTA considers it to be in the 'cute legislation' area, and unfortunately 'cute legislation' (i.e. that which plows totally new ground) has a history of difficult sledding in Congress. Dooley seems to back this up with his after comment "We don't see it as something that will happen immediately."

I) **'I have just studied the SPACE/STIA 'Four Year Report To Members' and I see that between 1981 and the end of 1983, SPACE expended \$565,500 in direct legal fees. I am naturally suspicious that this entire bill-program is really a move to create a long term commitment to spending more legal fees. How long might this take and what are the costs likely to total?'**

As the NCTA spokesman indicates, it will not happen 'immediately.' Legislation such as this must first be entered into the hopper (that has now been done), and then it is scheduled for sub-committee hearings. This is an election year and the chance that it will be so scheduled this year is slim at best. After the sub-committee hearings, at which testimony is taken on all sides of the issue, the bill can either

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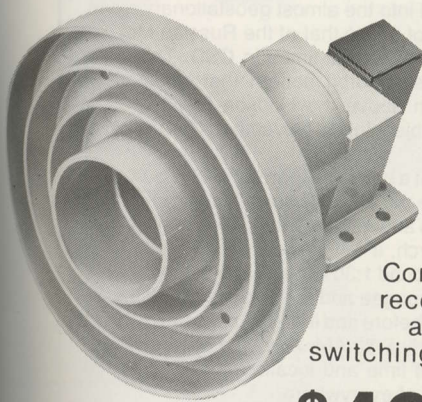


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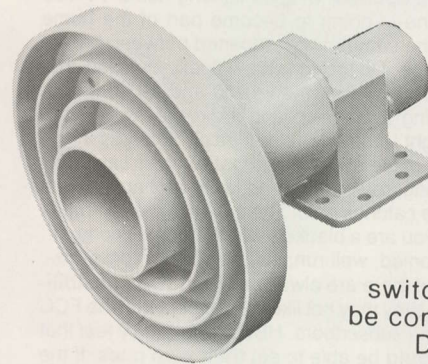
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go to a full committee for additional hearings, 'mark-up' (modifications), or directly to the floor for vote. Or it can be tabled, as often happens with a controversial issue, to be brought back up in another year or session of Congress. This is 1984. Seeing either bill passed prior to 1986 is wishful thinking. At the present **annual expenditure rate** of \$286,000 per year, SPACE's legal fees could amount to between \$576,000 and \$858,000 to get this legislation passed. And that assumes it moves on a relatively fast track.

J) 'What is the real 'Legal Status' of our industry while this proposed legislation is making its way through Congress? Are we any better off with this legislation pending than we would be without it pending?'

A proposed law has no direct impact, on lawsuits or other efforts, by those who oppose home TVROs, to continue to harass us. There can and probably will be additional Wichita (dealer) type lawsuits; there may even be lawsuits filed against individual viewers to 'test' the **existing** 1934 Communications Act, which the Goldwater bill seeks to modify. A court hearing evidence on untested issues is under no obligation to admit any testimony concerning pending legislation, nor to consider that pending legislation in making its own decision. In fact, in the recent Sony/BetaMax — Disney case (settled in favor of home taping), the courts clearly were not persuaded by the mountain of proposed legislation. Those who oppose home TVROs could, indeed, see the newly proposed legislation as a reason to initiate new lawsuits and we may actually have **more lawsuits** in the coming months as a result of the legislation being introduced.

K) 'How might the proposed legislation affect the Home Box Office plans to begin a C Band Direct service later this year?'

Unpredictable. HBO could, **on one hand**, view the legislation as an important tool to help them convince their cable affiliates that home TVRO viewing of HBO service is inevitable. If this happened, and the cable affiliates 'bought' the argument, we would see an entirely different level of attention towards home TVROs from cable system operators. If they become **convinced** that home TVROs are here to stay, and that HBO will sooner or later be 'forced' to sell 'directly' to home consumers, the smart cable operator will quit fighting home TVROs and start calculating how he is going to become part of the home TVRO 'money machine.' The same thing happened between broadcasters and cable; when the TV broadcasters finally decided that cable was not going to go away (between 1970 and 1973; it took several years for that feeling to develop and it did not 'sweep' the broadcast industry 'overnight'), they became heavily involved in the cable business, buying up cable systems as fast as their cash flow would allow. The same thing could, in fact is likely to, happen with home TVROs if that attitude catches hold. The guy who merely 'hates your guts' today, because you are a blankety-blank ('illegal') competitor may turn out to be a monied, well run, stiff competitor tomorrow.

On the other hand, and there are always **at least two possibilities** when it comes to HBO, they may not like the concept that the FCC will be setting 'rates' to home subscribers. HBO will naturally feel that in a 'free market,' **they should** be able to set **their own** rates. If the FCC sets rates for home TVROs, two additional things might happen to HBO:

- 1) The FCC might then decide to set HBO rates **to cable systems** (and their subscribers), on a 'rate of return' formula basis, and,
- 2) Once that movement starts, somebody might decide that HBO and others providing a similar service are really gigantic 'electronic public utilities,' like the telephone company. The next step after that is regulating HBO (et al) as **'entertainment utilities'** and when that happens, we have Bell telephone all over again. HBO will not like that possibility, at all.

So in the first 'perhaps' we have HBO mildly, or wildly, supporting the legislation. And in the second 'perhaps,' we have HBO fighting it tooth and nail. If they follow the second 'perhaps,' we think you can kiss HBO/CBD 'good bye' for this year and perhaps for many years to come. They won't jump in with CBD if they are fearful that they are opening up future rate regulation for ALL of their activities.

L) 'I sat through the SPACE/STIA Board of Directors meeting on March 17th and I heard no discussion of this legislation at all. I must assume that the Board did participate in the creation of the legislation and the development of the two

bills, plus, the decision to enter them at this time.'

Unfortunately, that is not true. The twin bills were as much a surprise to the majority of the Board of Directors as they were to the other 1,680 people in the banquet in Las Vegas. The 'commitment' to spend upwards of \$286,000 per year for as many years as it takes Counsel to get these bills through Congress was never discussed. The impact of these bills on the proposed HBO CBD program was never discussed. None of the ramifications were discussed. To the best of our knowledge, only Directors Dushane, Howard, Behar, Dalton and Johnson had any fore-knowledge of the bills. Counsel appears to have done this one 'alone' and without any Board guidance.

M) 'What should the position of the industry be, given all of the unknowns?'

Each of us will have to make up our own minds about the value to us, **as an industry**, and to our individual operations, of this proposed legislation. Ending the 'pirate label' should be our number one objective if we expect the industry to continue to grow, expand, and mature. **On the other hand**, if the price of maturity is to have an entire new level of international-grade OEMs in the marketplace, and to find our individual TVRO dealerships threatened by stiff competition from the local cable firms who may well enter the business as TVRO hardware and software distributors/dealers, well . . . each of us must carefully weigh the pros and cons of 'growing up.' We can't be children forever, but it is also a mistake to become an adult too fast.

THE Oscar 10 Satellite

Aware that many of our readers are heavily involved in electronics, and that some of those have an interest in 'amateur' or 'Ham' radio, I wanted to share some of my experiences with you concerning the OSCAR 10 amateur radio satellite.

Amateur satellites have been with us almost as long as commercial satellites. Using satellite systems and sub-systems designed and created by amateur radio groups all over the globe, amateur communication satellites have gotten 'piggy back' (as in free, no-charge) 'rides' into space on a variety of vehicles. The current excitement is being created by **OSCAR 10**, a satellite which lifted the hams out of the low-earth orbit business and into the almost geostationary world.

OSCAR 10 follows a path not unlike that of the Russian Molniya series; a subject we have visited several times in **CSD**. That's the Russian satellite which follows an orbit pattern that includes an apogee (maximum height) high above the Hudson Bay region of Canada. We last visited that subject in the November 1983 issue of **CSD**.

The OSCAR 10 orbit peaks at a height of approximately 35,000 km high above the 'north pole' twice per day. It is not in sun synchronization so it peaks at different spots above the north pole on consecutive days. As I write this late in March, it will be peaking at a location 7 degrees west of 0 meridian at around 1:30 AM eastern time. However, it is climbing towards that high apogee and turn around from as early as 9:45 PM eastern the evening before and it will not pass down, out of view and to the south until nearly 5:30 AM. A couple of weeks from now it will have moved its orbit time and location so that it will be peaking in mid-afternoon north of everywhere.

You must have an amateur radio license to communicate via Oscar. In the United States, you obtain the required license by passing an examination before a voluntary examination team. That involves a Morse Code test of 5 words per minute and a written exam, multiple choice answers, of perhaps 50 questions. The license is granted for a ten year period and is renewable without additional testing. In other countries, licensing is less controlled and it is possible to obtain a permit or license merely by filling out some pieces of paper and paying a small license fee.

OSCAR 10 is but a small segment of the wide world of amateur radio, but it happens to be the one segment which comes closest to what we all do for a living; using satellites. For around 8 hours per day, it is possible to use OSCAR to communicate with other amateurs a continent or two away. OSCAR, unlike the shortwave bands which the hams pioneered 50 years or more ago, is not subject to sunspot activity or other nasty things that make typical amateur radio activity so undependable. OSCAR 10 is like having your own, almost private, communications circuit over perhaps 40% of the earth's surface.

In spite of my professional interest in satellites, I have until recently

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had little interest in Oscar satellites. **Until** Oscar 10, we (amateurs) had only low orbit satellites. They were certainly challenging; you had to 'acquire' their signal as they came over your horizon and you had to 'talk fast' because the little buggers were constantly moving. Pretty soon they would pass over the **opposite horizon** and everything would be quiet until the next 'pass.' That was challenging, alright, but I had enough challenges in my life so only dabbled in that activity. Oscar 10's 8 hour 'window,' during which you can communicate almost at will over such a wide area, without interference or problems, was more my kind of satellite.

My 'station' consists of a pair of circular polarized antennas; one transmits to the Oscar 10 satellite in the region of 435.100 MHz and the other receives the downlink Oscar 10 'translated' transmissions in the vicinity of 145.900 MHz. The transmitter operates old fashioned Morse Code or voice (single sideband) at something under 100 watts of power. None of this will make much sense to the 'non hams' reading this, but what follows may.

Way back in 1979, I initiated an 'amateur radio net' which still today meets on Sundays at 2 PM eastern on the 20 meter ham band. 20 meters is one of those very crowded ham bands and you spend most of your time listening to squeals and Donald Duck sounding audio, trying to figure out **what** they guy just said. On Sunday afternoon, it is the pits. Nonetheless hams who have an interest in satellite TV still get together and exchange information. I abandoned the effort myself in 1981 or so.

Oscar 10 looks like a far better opportunity. The first night I was 'on Oscar' I quite by accident ran into hams who were into TVRO on three continents. My first random contact on Morse Code was with a fellow in Switzerland. He immediately recognized me and noted he had a copy of **CSD** on his desk. A couple of hours later I was talking on voice with a fellow in Sao Paulo, Brazil. He, too, had a copy of "Coop's" on his operating desk. In between there were another half dozen or so scattered across Europe and North America who were into satellite TV adventures, and who knew me. When a fellow in the Ukraine section of Russia asked if I was **'the Coop'** of **Coop's Satellite Digest**, I knew we were onto something substantial.



COOP Working Oscar 10 From Provo (VP5D)

My concept is that since Oscar 10 can provide coverage over 40% or so of the earth's surface at one time, we should 'meet' there to exchange the latest satellite TV data. Because of the prohibition against commercial business on amateur frequencies, this cannot be a 'commercial activity.' That's OK, we can exchange a ton of data nonetheless just as the 20 meter group I started five years ago has been doing every Sunday. The advantage to Oscar is obvious; small antennas, modest transmitter powers, and round-table discussions covering North America, Europe, significant parts of Africa, South America and even sections of western Asia in 'one pass'; or, coming the other way, the 'other' 40% or so of the world. It turns out that even in the states, the most basic type of amateur license (Technician Class) covers this type of operation so you don't have to be really into Morse Code and electronics to qualify for a license. Those who would like to get the ball rolling will find me hanging around 145.920 on the

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downlink side when my own travel schedule coincides with Oscar 10 'passes,' and reasonable operating hours. Those who would like to set more definite schedules can drop me a line here at CSD.

THE Baltimore 'Bullet'

The recent history of cable system franchising in the city of Baltimore has been muddled. First a number of large firms wanted the franchise. Then the City started making outrageous demands (number of channels, number of public access studios, kick-back bucks, et al) and the number of applicants thinned out. Late in March all of the big applicants, save one, notified Baltimore they were no longer interested in Baltimore. After losing their favorite pro-sports team, that came as a shocker.

When the big guys pulled out, they gave several reasons. One of them, frequently recited, was that by the time the Baltimore franchise is granted and the system is wired, 'DBS will be so well situated that cable will have a tough go.' The cable guys were probably not that worried about (12 GHz) DBS but the city fathers got upset nonetheless. So they got together and wrote an ordinance; one that would charge ANY dish owner a flat \$50 fee and then would require that any dishes over three feet in size go before the zoning board for a special permit. The city fathers believed the cable story, and in an attempt to get the cable bidders back in town, thought up this creative bit of legislation to straighten out the DBS guys. One can only assume that the \$50 fee is designed to make people think twice about buying DBS, and that the zoning permit requirement for dishes over 3 feet in size is to make people think more than twice about CBD DBS (C band direct service).

USCI, the early-start 12 GHz service, recently started marketing in the Baltimore region. They use either 2.5 or 4 foot dishes. Their larger size would obviously fall into the 'special zoning permit' realm intended by the new local regulation. USCI said they were in favor of the zoning ordinance, but wanted the size lifted from 3 feet to 4 feet. In other words, they saw here an opportunity to shut down C band equipment sales in Baltimore and get themselves some extra protection. The \$50 fee didn't seem to bother them too much. Well it should

not; they won't pay it, and anyone who is opting for the nearly \$700 package probably won't be turned off by another \$50 anyhow. And if they are clever marketing people, they can make the customer think he is getting the \$50 permit paid by USCI anyhow by some creative juggling of numbers.

We wrote last month that the Brown and Finn filing with the FCC, intended to clear up the zoning ordinance problem once and for all, was very nifty; but we pleaded that the industry urge SPACE to take that pleading not to the FCC but to the Congress itself. In a roundabout way, the Goldwater bill discussed here this month (S. 2437) might do this. But it would be far better to have specific language in the Goldwater bill which tells cities such as Baltimore that the FCC has not only approved home TVROs, but that the home TVRO system owner cannot and shall not be subject to local harassment by zoning ordinances which attempt to circumvent the 'national' law.

Baltimore is no fluke; it can and will happen again. We can get out of this mess by addressing it straight-on and insisting that the regulators recognize us for what we are.

ALTERNATE Source/International TVROs

For almost as long as there has been a TVRO industry, there has been a Bob Behar traveling the world installing big (bigger, biggest) screen mesh 'international' grade TVRO systems. And we have, through the years, followed Bob all over South America, the Caribbean, Africa and the Middle East. Bob has gotten plenty of 'mileage' out of CSD stories covering his exotic installations and I suspect not a few of his 'sales' resulted from the publicity he received from those stories.

Bob appears to have some competition now and in the interest of fairness I am anxious to see that there is publicity for those who are also hauling massive amounts of metal and electronics to far-away places.

I have been aware of Dan Berge and Continental Satellite Systems (11485 S.E. Highway 212, Clackamas, Or. 97015; 503/656-9878) for a couple of years, but did not know how far he had matured into an 'international grade supplier' of TVRO systems until



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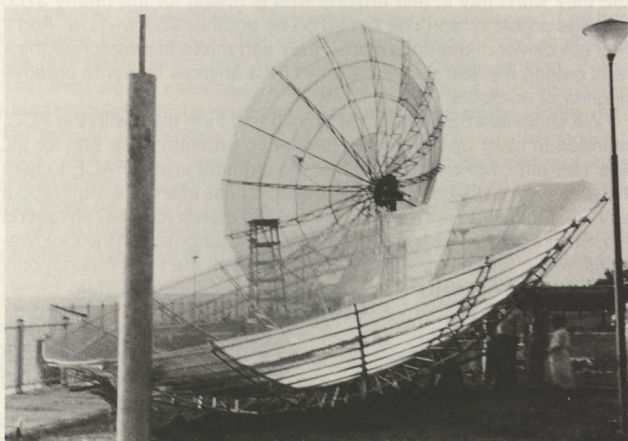
or abandonment were the alternatives.

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9.3 METRE DISH ready for mounting on ground post; 7.3 metre dish already installed in background in Abu Dhabi.

recently. Berge is kind of quiet (although he cranks out a 'mean series' of press releases with Sheila Lynch, his marketing representative) and you have to spend some time getting to know him to appreciate that he has some unusual and much needed talents in the antenna design area.

Berge's Continental has recently completed some installations in places such as **Abu Dhabi** (just about half the way around the world from Clackamas) using Continental 7.3 and 9.3 meter dishes. No, I didn't know Berge manufactured dishes that large, either. The first installations were 7.3 meters in size. The pictures seemed good and the buyers (who saw Berge at the Orlando SPACE show and made the initial deal there) came back asking for more, 'better.' That's where the 9.3 meter came in.



AFRTS on the screen/ and one satisfied customer in Abu Dhabi

Abu Dhabi is the seat of government for the United Arab Emirates on the Persian Gulf. Domestic TV is less than great, short hours and not much in the program variety department. Because of the intensive oil income, there is money (plenty of money) around. Some of those that are monied would like to have a better choice of television programming. **Enter Berge and his big dishes.**

Fighting the usual language barriers, a wet and sandy soil (barely feet from the surf), and the required knock-down every day for five separate prayer sessions so the work crew could face Mecca and conduct religious ceremonies, the systems were installed and promptly brought in services from Sudan, Saudi Arabia, Russia, Zaire and the much desired AFRTS from 1 degree west.

Berge did something commendable in the process. He deliberately set out to train personnel in Abu Dhabi to do the assembly and

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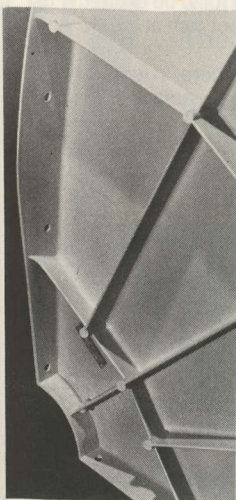


When 2° spacing becomes a reality in a few years, what would you rather tell this year's customers...

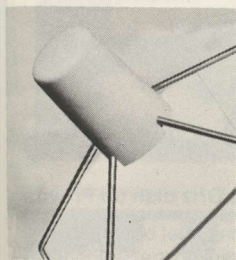
"I'm sorry that your reception is so poor. But, there's nothing I can do about it. Your dish just can't handle 2° spacing."

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installation work on the 7.3 and 9.3 meter (metre) dishes. Now he has a 'trained crew' on site and in the future, as more systems are sold in the area, he can get by sending just a supervisorial tech or engineer to insure that the system goes together properly.

The **Continental Silverline** dishes look like they are more than competitive to the big Hero dishes (also in the 7 and 9 meter size region). Those who have a need for large antennas in off shore locations can now shop between Hero and Continental, and that is progress for the industry.

ANOTHER Fall Trip

Last November a group of 20+ gathered in San Francisco for an around-the-world trip that eventually ended up in Arthur C. Clarke's den in Sri Lanka. There, as most know, we spread out and in six days installed three TVRO terminals between 16 and 25 feet in size for various locations in Sri Lanka.

There has been talk of what we might do **this coming fall**. Most of those who traveled with us last fall agree there is very little we could do to 'top' the 1983 trip (see **CSD** for January 1984 for a full report; some copies still remain in the storeroom in Fort Lauderdale and are available postage paid in the US for \$5 each). However, a tentative itinerary is being prepared and we are trying to schedule a 'trip' in between the various trade shows for this fall.

Most of those who toured last fall were in Las Vegas and we held a number of informal meetings to discuss timing and how we might handle the 1984 trip-version. We came to several conclusions:

- 1) A group in the 20 to 25 size is close to ideal. Any more than that and we have massive logistics problems keeping everyone together and getting into the various tour buses that provide ground transportation at each stop.
- 2) Those who traveled last year should be given first option of going again in 1984.

The tentative plan is that we will depart from the west coast and **re-visit Japan** as our first stop. It will be time to re-see the progress being made, first hand, with the Japanese TVRO technology. When we visited Maspro and Uniden in November of 1983, they were at a certain stage of development with their 4 (and 12) GHz products. In the fall of 1984 that progress will be considerably changed.

After Japan we will go **on to Hong Kong** because no trip to the Orient is complete without a shopping-stop there. We have another reason for stopping there; it is a mini-tour-start point for a trip **into mainland China**. What I am working on is a special tour into China which will allow us the opportunity to visit some of the early Chinese 4 GHz facilities. China has an ambitious plan to serve thousands of downlink sites with 4 GHz links from their own domestic birds. Naturally we'd like to see what they are doing.

Coming back out of China, a shorter stay in Hong Kong, and then **on to Singapore**. Virtually everyone who travels that part of the world tells me that Singapore is a 'must stop' because of the extremely impressive facilities there. Oil money, I am told. The trip, after Singapore, is a tad up in the air. There are 'votes' for New Zealand and Australia and the Philippines. And there is **my vote for Jakarta, Indonesia** since I have a standing invitation to visit the Palapa control

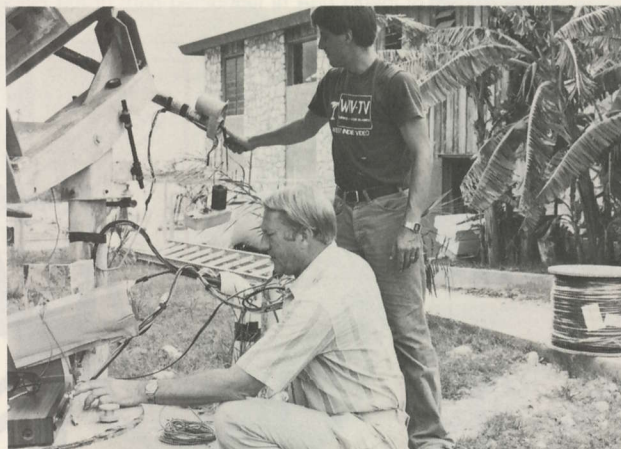
system. I still feel that it will be the presence of the Palapa system in Asia which will eventually make, or break, the opportunity for a 4 GHz 'industry' there.

This looks like three weeks to me; give or take a few days. We will not be going around the world, this time. We will exit and return via the west coast. In between, at least three stops with 'satellite business' plus the usual good fun, sightseeing, and of course shopping. It is NOT too early to drop me a note here at CSD indicating you would like to go onto a list to 'be considered' for this year's travel group. Remember that virtually all of the 20+ who went last year have indicated they would like to go again, and that leaves us with perhaps five or six 'openings' at this stage. An early letter is advised.

12 GHz In The Caribbean

Almost one year ago I mentioned to a friend at **DX Antenna Company** that I would like the opportunity to 'test' some 12 GHz gear down here in the Turks and Caicos Islands. DX has one of the few 'shippable' 12 GHz packages available and in fairly short order we had one of their LNC units (3.8 dB noise figure, or about 500 degrees K) plus a slightly modified DX receiver from their 4 GHz family. We decided to give it a try but knew at the outset the odds were stacked against us.

- 1) The 12 GHz birds (SBS and ANIK) should have no usable footprints here, some 650 miles southeast of Miami. At least not on any practical size dish.
- 2) The 3.8 dB noise figure on the DX LNC is fine for strong footprint areas, but down here it leaves a lot to be desired. For comparison, it would be like using a 30 foot dish at 4 GHz, and **NO LNA** at all!
- 3) We have no **12 GHz-proven** dishes down here. In fact we have no spun metal dishes at all so we did some surface measurement and decided an old SatFinder 10 foot dish (a fiberglass antenna with a screen mesh reflective surface inside of the fiberglass sandwich) would come closest to being a 'suitable' surface at 12.



DX 12 GHz receiver system and SatFinder 4 GHz dish on Provo.

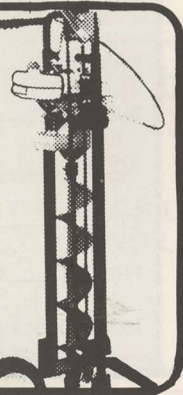
Armed with this set of problems Marshall and I set out one afternoon to try the system out. We carefully hand cranked the SatFinder a notch at a time knowing that everything gets three times as critical at 12 as it does at 4 (GHz). After forgetting to properly set the LNA plus feed (a Chaparral 11.7-12.2 GHz 'super' feed) squarely at the focal point on the SatFinder, and a fruitless initial search we came up on a pair of video signals off of a single bird. It was SBS-4 and we found video on the DX receiver on push-buttons 5 and 17. The signal on 17 was about 1/2 dB stronger but neither were good enough for color.

We spent the better part of an hour tweaking and finally came to the conclusion that between the weak footprint, the 3.8 dB noise figure front end and the questionable performance of the SatFinder dish at 12 GHz, we were not going to get into the broadcast quality realm.

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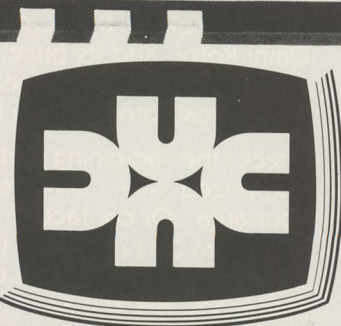
Taylor Howard, Co-Owner, Chaparral Communications

Bill Johnson, Chief Engineer, Microwave Filter Co. Inc. discussing TI.

Dave Beeching, Director, Marketing and Sales, Oak Satellite Systems covering the ten questions you've always wanted to ask about scrambling.

Rick Schneringer, President, STTI, reporting from the next Trade Show at Niagara Falls.

Chuck Hewitt, General Manager, SPACE with information on new legislation and organizational plans.



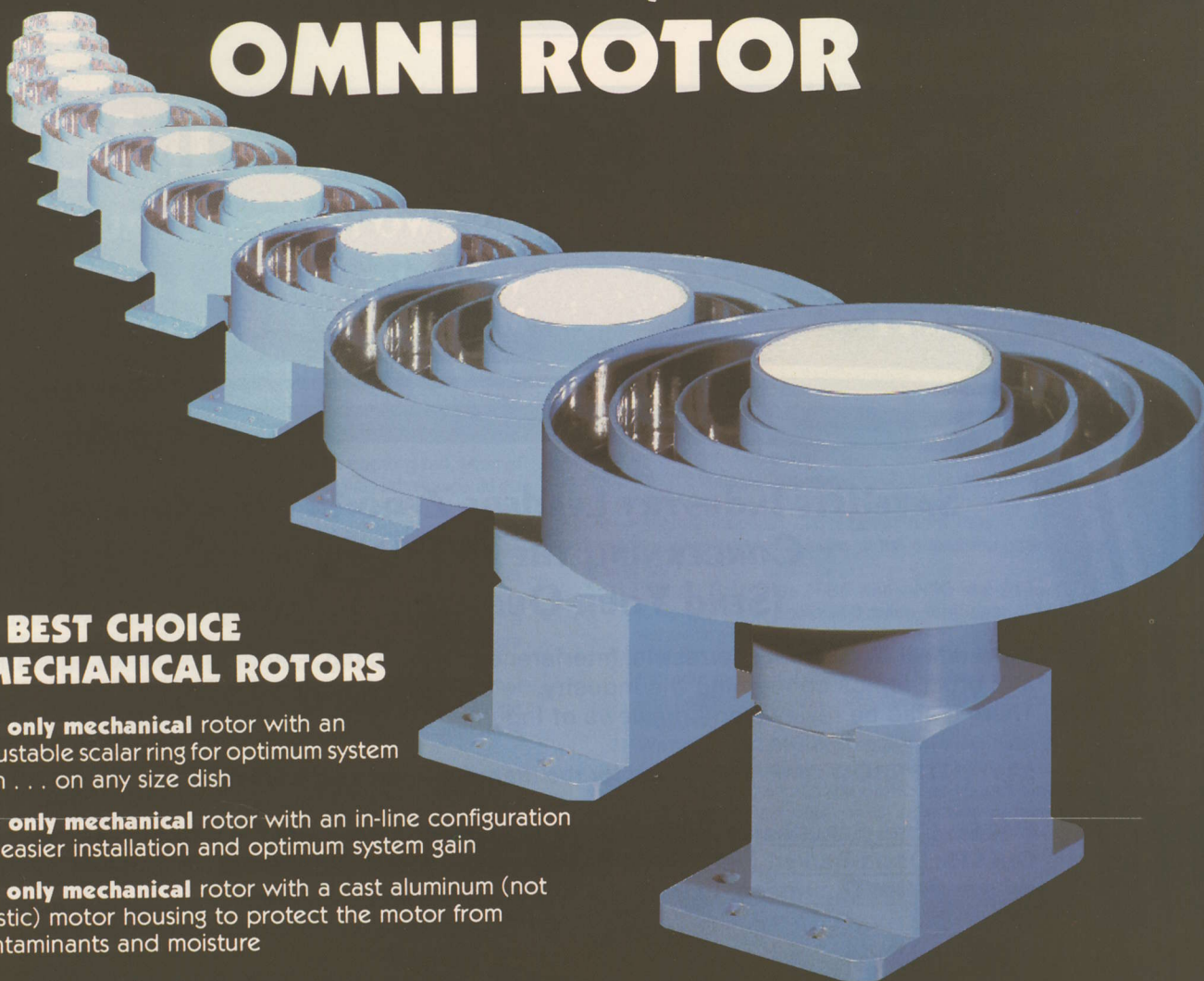
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Omni Spectra

M/A-COM OMNI SPECTRA, INC.

COOP/ continued from page 78

Where we ended up was about 1 dB of CNR; at least 8 and probably more away from suitable color quality.

The most suspect part of the system is the dish since we have no way of verifying the screen mesh opening size nor the accuracy of the mesh surface **inside of** the fiberglass sandwich. The SatFinder went out of production more than two years ago. A ten foot spun dish would be a suitable replacement; an 8 foot would be a step in the right direction. If we should determine, after changing out the antenna, that the SatFinder is not that bad at 12 GHz (there IS a reason why nobody offers 12 GHz fiberglass dishes!), we are back to two obvious fixes:

- 1) The 3.8 dB noise figure certainly could be improved but with the exception of some laboratory stuff, there are no LNA units out there on the 12 GHz market with really adequate noise temperatures (say 150 to 200 degrees K as a start).
- 2) The ultimate dish size, for our 'uncharted footprint region,' may turn out to be closer to 20 feet than 10 feet. Now getting a high quality, highly accurate surface at 12 GHz in **the 20 foot region** is no backyard effort. Tolerances to 1/48th of an inch are called for and holding those over a 20 foot surface is not something you do for the price of an ADM 20 foot petal parabolic. In fact, you may not be able to do it with petals at all.

Naturally I am hopeful that we will be able to make the system play without getting into the 20 foot aperture size reflectors with 12 GHz accuracy. I have nothing against 20 footers (there are six that size and larger now here) but few have the surface accuracy or mount rigidity required for 12 GHz.

I must admit that a lump did rise in my throat when the first faint diagonal lines indicating sync appeared on the screen from SBS. I hadn't had that lump for several years; back when we knew as little about equipment and system requirements at 4 GHz as we now know at 12 GHz. It was a good feeling to see that those emotions could still be stirred, and naturally we will not rest easy until we have done everything possible to take our barely-in-sync signal up into the high quality color region we now duplicate with such ease at 4 GHz. Speaking of which, how are YOUR experiments at 12 GHz coming along? You haven't written to update me in quite some time!

RESIGNING As A Director

By now most are aware that following the March 17th meeting of the Board of Directors of SPACE, I came to a decision; a personal decision. I could no longer serve on the SPACE Board. You deserve to know why since I started SPACE and have tried my level best to keep it together under some very trying circumstances, in the interim years.

Everything, and everybody, grows up. Or at the very least, they grow older. Sometimes **aging** includes **changing**. I have pondered whether or not the baby I created, SPACE, has simply changed and I, being an old fashioned stick in the mud, have not changed with it. I offer this as a distinct possibility, and in which case 'my problems with SPACE' are a result of my reluctance to change with a changing SPACE.

There are other possibilities, of course. Perhaps SPACE is changing, but it is not changing in a healthy manner. I remember when current Prexy Dalton (KLM) and current Chairman Johnson (Paradigm) were elected, some of the press keyed off of their election, and the election of others, as a 'changing of the guard'; a **'new era of growth for SPACE and the industry.'** I avoided that comparison since I have known both Dalton and Johnson for many years and didn't see that much that was 'new' in their approach to SPACE or the industry.

Let's review the positive things that happened at the March 17th board meeting, first.

- 1) The new Executive Vice President, **Chuck Hewitt**, was introduced to the group. He had been found, interviewed and then hired by a selection committee that included Taylor Howard, David Johnson, Peter Dalton and Richard L. Brown.

Hewitt told us he had no pre-conceived notions about how to run SPACE. A board member asked if Hewitt had been given any kind of 'outline' as to **what** his duties would be, **whom** he should report to, **what** his priorities would be. The answer was 'no.'

COOP/ continues on page 85

NEW FROM CSD TERRESTRIAL INTERFERENCE.

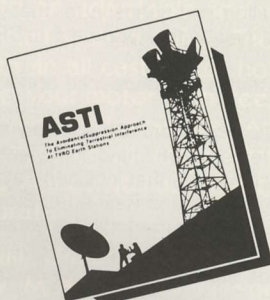


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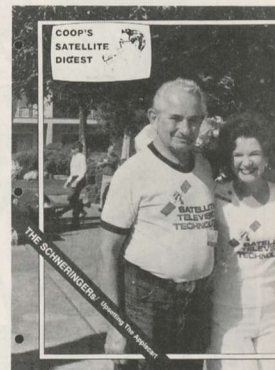
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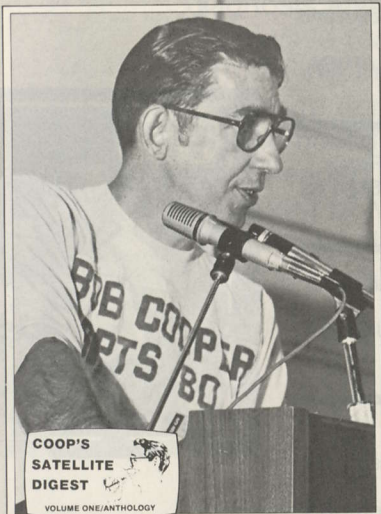
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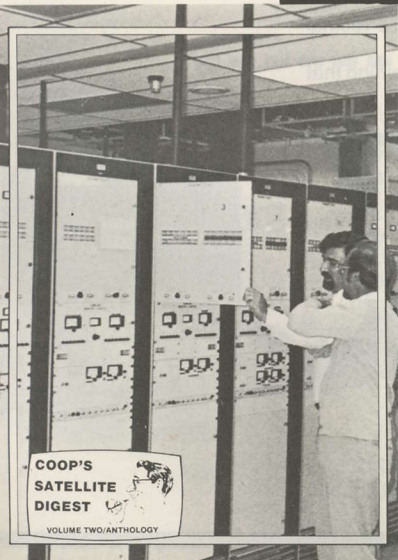


DO THE BASICS of home TVRO baffle you? Do you wonder how LNAs or down converters or antennas evolved as they have? Do you understand why **Taylor Howard** is the 'dean' of the industry's engineers? **CSD ANTHOLOGY** has it all sorted out for you. We have taken the first two years of **CSD** (October 1979 through September 1980; October 1980 through September 1981) and we have created 'CSD ANTHOLOGY'; Volumes one, and, two. From the very first day of our industry (**officially** recognized as **October 18, 1979**) forward, CSD Anthology follows (and leads) the developments which shaped the industry we know today. From LNA design work (by Bob Coleman) to antenna designs by Oliver Swan, the very basic roots of TVRO are laid out for you in typical 'Coop-Style.' Twenty-four times, month after month, for the full first two years of our industry.



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CSD ANTHOLOGY/ Volume Two is everybit as exciting as Volume One. Starting with the October 1980 issue, we see complete details for building a two-stage NEC GaAs-FET LNA. The fellow who shared this information was another pioneer; **Norman Gillaspie**. The same issue reports on the start-up of a 'new' firm that was going to revolutionize home TVRO sales; **National Microtech**. In the November 1980 issue Taylor Howard issued a 'warning' to dealers who were installing LNAs without bandpass filters; something called 'out of band' noise was making the then popular 120 degree units act like 180's or 200's. Naturally Taylor had a solution to the problem! In the December issue we were concerned with **Sat-Tec** receivers that 'lost their alignment' between the factory and the dealer; we told readers how to 'field-align' a Sat-Tec R2A receiver for best pictures. In February of 1981 we first reviewed the **Washburn/Earth Terminal** receiver. Way back ... in February 1980 CSD carried the first advertisement for the Washburn (Earth Terminals) receiver; **only \$2995!** Terrestrial interference reared its ugly head in 1981 and in the July CSD we explained what it was and how it could be cured. **Microwave Filter Company** read the report and started producing 'TI' filters; once again, **CSD got somebody started in the TVRO hardware business!** And so it was issue in . . . and issue out, during all of 1979, 80 and 81; **people helping people** start a brand new industry.

COOP/ continued from page 81

- 2) There was a report from the 'Show Committee.' Bob Behar did most of the talking. The SPACE show made lots of money for SPACE. They made money on the banquet (1700 seats sold) and they made money on the exhibit hall space (161 exhibitors with 291 booths) and they were making money on the various admission fees.

That SPACE made money, was able to pull off the convention with short notice, is admirable. Unfortunately, I detected a 'hunger' on the part of some members of the board; an almost insatiable appetite to gobble up more and more money from the industry. Director Dushane



HEWITT faces his employers

(Janeil) was particularly aggressive about pushing SPACE into a full schedule of shows. We'll come back to that topic.

- 3) There was a report from David Johnson dealing with the special 'Downlinking Seminar' program he was conducting at the SPACE show. He would end up with around 500 people attending the 'certification' program, and making money aside, the program had many positive benefits.

There was no question that the concept of conducting an academic level course in downlinking was a bright move. That any of the people who attended would 'get rich' by becoming a part of the national downlinking 'pool' of qualified operators is academic.

- 4) There was a financial report. Faced with controversy about where all of the money has gone, Brown and Finn pitch for the apparent assistance of some accounting people put together a booklet entitled '**Satellite Television Industry Association, Inc. / SPACE / Fourth Anniversary Report To Membership.**' The booklet, 16 small pages, is a not so subtle sales pitch for supporting SPACE. It tells us that 'Legal Fees' (one expense item out of 7 categories listed) ate up 41% of the association's revenues in 1981, 81.9% of the association's revenues in 1982, and 56% of the association's revenues during 1983. In the same time span the total revenues climbed from \$26,800 in 1981 to \$419,900 in 1983.

I was pleased that the numbers I saw in the booklet closely matched the numbers I have in a copy of the Form 990 obtained from the Treasury Department under the Freedom of Information Act. In other words, the official SPACE tax report (available to almost anyone under the FOIA) is within percentage points of the booklet numbers.

- 5) There was a report on the progress in the so-called 'Zoning Cases.' This is the situation where local zoning boards are attempting to regulate TVRO use by prescribing limitations on dish size and dish location in a person's yard. The bottom line was that zoning cases continue, they are costing SPACE money, and not much progress could be reported to date.

I made a plea that SPACE take the filing made by Brown and Finn, last December 19th with the FCC, and turn that into legislation to go

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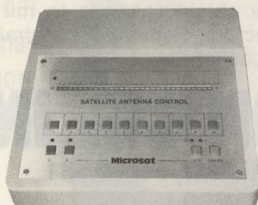
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before Congress. I **knew**, at the time I **was pressing** the board on this issue, that my April issue of **CSD** contained an equally strong request that SPACE stop messing around with the FCC on this issue and go directly to Congress. I got an interesting reaction.

Now up to this point the Board meeting was 'open'; anyone who wanted to sit in could do so. There were many members of the trade press, some pioneer members who are not on the board, a couple of dealers, distributors, and some interested unidentified people. Everything was above board and open, even the discussion of a 'negative'; the **next** SPACE trade show.

During the report on the Las Vegas show, the discussion shifted to the 'next show.' Several members of the board, led by Janeil's Dushane, pressed for a show which would come as close in time, and as close in proximity, to the already scheduled STTI Nashville show (September 3-5), as possible. I got the distinct feeling that at least some of the board figured at this point 'they had STTI' down on the floor for a final count. Things looked pretty good for the SPACE show (which would open the following morning) and if you practice incest and only talk with people who have the same vibes as you, pretty soon you have a 'roll going' in which you can **convince yourself** of almost anything you wish. **This group** 'felt so good' about the success of the SPACE Vegas show that they were ready to hit straight for the STTI jugular vein. I was sitting next to Peter Sutro (Patmar Technologies) and he and I both had to forcibly control ourselves to keep from throwing up on the table. The animosity revealed was both electrifying and shocking. Here was a group of people locked in a multi-million dollar lawsuit, and they were defendants in the suit. The lawsuit charged that they were setting out to conspire to put someone else (STTI) out of business. So what did they decide to do about the **next** such situation?

You got it. They decided to select a date and location for the SPACE Fall Show' which was designed, **on purpose**, to make life as uncomfortable as possible for those dealers, distributors, and OEMs who would populate the show(s). I would have to sleep on that.

Discussion turned to a small machine sitting openly on the table in

front of me; a \$59.95 cassette tape recorder which I had picked up at Radio Shack in Fort Lauderdale the day before flying to Vegas.

"Was I taping the meeting"?

That seemed like a dumb question. By now I was into the fourth tape-side of the meeting and since this was a not very fancy machine each time the tape filled a side, it 'clunked off' with an echo you could hear all over the room. I **was** taping the meeting.

"I believe those tapes are subpoenaable," commented Counsel Brown. He went on to note that SPACE was involved in a lawsuit concerning trade shows, that there had been a 'frank and open discussion' of the 'SPACE strategy' concerning the fall trade show, and any tapes made of that discussion were 'evidence.' I suggested that the room was filled with witnesses, and I suspected there were other tapes as well. **Lloyd Covens** of **Channel Guide** quickly admitted he had been taping the meeting.

"I would like those tapes turned over to me," urged Brown. The debate continued. It continued for nearly 45 minutes. My tape ran out and I neglected to load a new tape into the machine. In the end, nobody had the guts to 'demand' that I turn over the tapes and after wasting 45 minutes the subject died. Fifteen minutes later I knew what I must do and I quietly bundled up all of the tapes made and sent them to Brown through a 'messenger.' Lloyd Covens kept his tapes.

What I would later learn is that prior to the Board meeting, there had been a private meeting of a 'clique' within the board. That clique was presented with a preview of a motion one of the members wanted to offer at the 'open' meeting; that I, the founder of SPACE, be asked to resign because (as the motion put it) "There are severe conflicts of interest when a journalist sits on the Board . . .". That motion did **not** come up; the tape recorder 'issue' had been a suitable substitute for the motion which was designed to 'condemn me,' **the journalist**, for having the brashness to write about SPACE and its management as I did in the March issue of **CSD**.

That was not the only thing that did **not** come up. From the floor, a pioneer member asked the board to clarify **"how it is that Senator Barry Goldwater received a TVRO terminal, as a gift."** You may not be aware of it, but 'gifting' a Senator or a Congressman with a TVRO

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terminal is a no-no. It violates 'canons of ethics.' After the question from the floor, there was a long, pregnant pause. The pioneer re-asked the question.

'Yes,' the Senator **was** the recipient of a TVRO terminal. "But," the answer came back, "it was given to an 'Amateur Radio Club,' not the Senator himself." The guy asking the question wondered who was involved in deciding **'which brand** of antenna, **'which brand** of receiver, **'which brand** of LNA' (etc.) ended up at the **'Goldwater Amateur Radio Club.'** The finger was pointing at the General Counsel but no answer came forth. While all of this was happening, I sunk down in my chair wondering how far THIS ONE was going to go. Just days prior to the Las Vegas meeting, I **had been called** by two reporters for a major U.S. news service. They were onto a 'story' involving Goldwater, the TVRO industry, Senator Dole and others. I had listened to their 'evidence' and I had learned a great deal from them. They had learned nothing from me, although I could have filled in many of the missing pieces they were looking for. I **admit** that I deliberately withheld information **from these national press guys**, at that time, because I could see this one blowing up all over the USA. "Did I think there had been some improprieties involved?" they asked. I suggested they call me back in a couple of weeks.

Fortunately, perhaps, the pioneer member didn't push the 'Goldwater terminal' questioning very far. He stopped far short of involving a much larger segment of SPACE. But I knew there was a time bomb ticking away there, **and I still know it.** And now when they read this here (they **do** subscribe to CSD), they will know that I know it.

Shortly after the Board meeting broke up, I ran down Bob Behar. I asked him if he thought the Board accomplished anything. He told me yes, and what. I asked him **why** there had been no real discussion of the allegations concerning Richard L. Brown; had not this been the opportunity to clear the air, once and for all? He said he felt the air was cleared.

"**Brown is still a Vice President,**" I chided, not sure whether he was or not. I heard nothing about that question at the Board meeting proper. "If he is, we can't have two," Behar replied. I dropped the issue for that day; Saturday.

I slept poorly Saturday night, wondering **just what had really happened to SPACE**; how we could continue to be in a multi-million dollar lawsuit, how we could be uptight about a set of audio tapes made within an 'open board meeting,' and **still have** a majority vote to go ahead and schedule a 'fall show' **right on top of the guy** who was suing us for our spring show!

Eventually I turned to the minutes from the January 9th meeting of the Board; a meeting which I did not attend, and where the last ditch attempts to reach accommodation between SPACE (it was still SPACE then!) and STTI had fallen apart. I read them over, twice. What I was looking for was some indication of how we had moved from a 'Board of Directors' to an 'Executive Committee' form of government.

You see, what has transpired since January is that **SPACE has changed its name** (from SPACE to S.T.I.A.), and **gotten involved** in numerous contracts and lawsuits, has **openly courted** the Canadian trade association C-SPACE to co-sponsor a trade show in Canada, had created and **published** public financial statements, has **hired** a new General Manager . . . and who knows what else, **all without holding a meeting of the Board of Directors.** I found that intriguing. What I found was that the January Board meeting authorized a new Executive Committee, made up of the Chairman (Johnson), the President (Dalton), the Vice President (Brown), the Treasurer (Behar) and the Secretary (Wysong), **to make any decisions necessary** with 'the power of' the Board of Directors. From a 23 man board, where on a close vote it takes 12 members agreeing, to a 5 man committee where on a close vote it takes 3 members agreeing **is quite a change!** By morning I knew there was only one thing I could do. I went looking for Bob Behar.

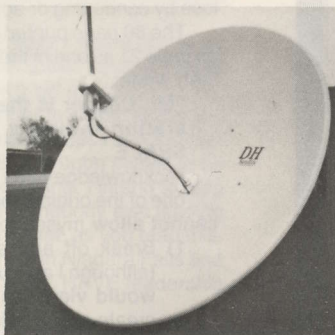
"**Here is my check for the first month's Pioneer Member dues,**" I said to Behar, handing him a \$300 check. I also handed in my application/registration form. "Why do that?" he asked, "You were voted a Member for life back in 1981?"

"**And, here is my resignation,**" I went on, and I read it to him out of the notebook where it had been penned. We talked about it. I re-brought up the question of Brown being a VP and Hewitt being a VP. "Come to the formal ceremonies when Hewitt is introduced to the

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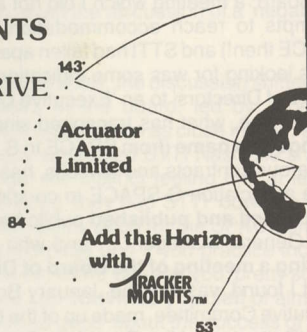
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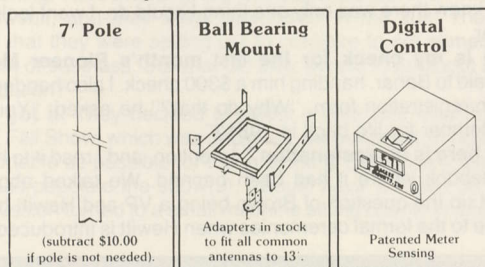
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membership," he urged. "Brown will be resigning his VP position at that time, in deference to Hewitt," he told me. I smiled. Unasked was whether Brown would still be on the five man Executive Committee.

"Look, we don't need anymore rumors or problems at the show. Will you withhold any public announcement until after the show?" he asked. I mentioned that I had considered putting it on Intersat's 'Radio Free Space' channel 11 message system in the hotel. He gulped, and I agreed not to do that before I talked with him again. In the end, I simply did not make any such public display of the resignation.

If you are a reader who comprehends, you can probably find several good reasons for my resignation to this point. I have been (one of three) representing 'consumers' in the industry for many years. I was elected by the "consumer members," whomever they might really be. It is my intention that my absence from the Board shall be temporary; **only until the next election.** My 'plan' is open and above board. It is not devious, it is not intended to upset anyone's 'honest' apperception.

I have chosen, given several options, **to attempt to 'reform' SPACE from within.** There have been numerous people who have come to me suggesting that 'we' start another trade association. I have several dozen reasons why that is not the best approach.

We already have a trade association. It is suffering, I feel, from an illness. It is not a terminal illness. There is greed, and avarice and poor judgement littering the recent history of SPACE. There are 'insider deals' that threaten to make national headlines and there is a manipulation of the membership, for political purposes, which could become 'terminal' if it is not stopped.

But when I look around the Board and I see people like **Donald Berg** of Channellmaster, **Ronald Wysong** of R.L. Drake, **John Applegate** of Gould/Dexcel, and **Peter Sutro** of Patmar, I see level headed, honest, straight thinking individuals who have far too much to lose by condoning or agreeing to much of what has gone on recently.

The 80 page printed program for the SPACE convention listed me on page 21 as one of the 'Technical Speakers.' In part, somebody (not me!) wrote:

"Mr. Cooper is the acknowledged father of the home earth station industry and one of the original founders of SPACE..."

I acknowledge that I am the 'father' of this industry. And that I was one of the original founders of SPACE. And that is precisely why I cannot allow myself to:

- 1) Break off and start a new, competitive trade association (although I am sure there are others on the present Board who would view this as a fine opportunity to 'make money' and create a new 'clique' of power), or,
- 2) Watch SPACE further disintegrate into a private club run by perhaps 6 to 8 individuals who simply lack the business or personal maturity to treat OUR trade association as something which belongs to us all, rather than those who happen to be in power at the moment.

So here is my 'plan.' This is my complete plan, and I am not holding

back on any 'secret' details.

Number one: I intend to create a 'slate of 12' to run for the next election. Using the present SPACE by-laws, we will run as a group of 12 and we will follow the democratic process to attempt to 'gain control' of SPACE.

I would much rather have 12 guys stand before me and **tell me** that they are going to run as a group, **and work together** where practical as a group, and KNOW that they are going to do this, than to have 12 individuals run alone and then see 'back room deals' put together to quietly wrestle control of the trade association away from the others on the board who are not part of the 'inside group.'

I have formed a small committee of other 'concerned pioneers' who will help me with this. I am publicly asking for input from as many people (members and non members) as possible. It is my intention that meetings involving people who are concerned about SPACE's future take place between now and election time. I plan to call for a **public meeting to be held during the STTI Niagara Falls regional show June 12-14.** I have not asked the STTI people if we can have a meeting room to do this, yet, but will before you see this in print.

Number two: I would like to see a 'SPACE Reform Platform' drawn up; a platform which sets forth so that everyone who is a voting member of SPACE can carefully read just what this group stands for, how it intends to reform SPACE, what changes in SPACE control it envisions. I would like the 'Platform' to be the result of as many 'caucus' type meetings as possible, held at trade shows where practical, between now and the fall elections.

I have established a special file at the CSD office. ANYONE writing to me about the 'SPACE Platform' will end up in that file. **None of these letters will be published,** unless the writer specifically requests that it be printed. All of these letters will go to the 'Reform SPACE Platform Committee' and will be considered 'raw input' in the platform creation process.

Number three: It is my belief that when the elections are held this fall, we should and will be accorded the opportunity to see that every member receiving a voting ballot ALSO receive a full set of the platform documents which the 'Slate of 12' finally adopts. This means that we will have to **'insist'** that the elections THIS year be held in such a way that nobody can affect the outcome by re-writing the background material on each candidate (for the ballots), nor can the 'listing of candidates' be structured so that 'favored names' appear together, or at the top of the ballot, or any other mickey-mouse gerry-mandering.

There **have been** complaints, in the past, that the 'staff' of Brown and Finn, preparing the ballot materials, was in a position to influence the outcome of the elections by the way they structured the balloting material. Obviously there is no place for this type of hanky-panky in a respectable trade association, and whether this happened in the past is not important; that it shall not happen in the future, is important.

Number four: The selection of the 'Slate of 12' will be as democratic as possible. In a year filled with primary and general elections on the local, state and national levels, we all have been (or will be) dulled by the entire process of 'selecting leadership.' This is probably not the best year to try to build a democratic foundation for our trade association!

I have joined SPACE as a Pioneer because I would like to be back on the board, **as a Pioneer.** Yes, I have asked several people (about six to date) to carefully consider being on the 'Slate of 12.' Somebody has to take the lead, asking people to **think about** the future of SPACE, and their own future in this business. As the 'acknowledged' father of this industry, I have taken it upon myself to be that 'somebody.' However, as we get the ball rolling, I intend to step back and down. I would much prefer to have somebody else leading this effort and a few are cautiously considering that, as you read this. In the final analysis, if we hold 'caucus meetings' in Niagara Falls and elsewhere between now and early Fall, we WILL HAVE leadership step forth.

Naturally I do have quite a few ideas about how SPACE should be restructured. These are **my own** ideas and whether any of them find their way into the formal 'platform' will depend upon the Platform Committee. **The 23 man board** is too large, I believe. Not necessarily

COOP/ continues on page 92

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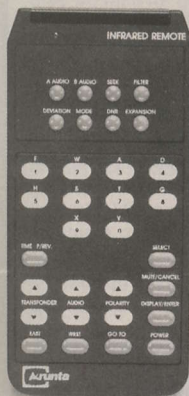
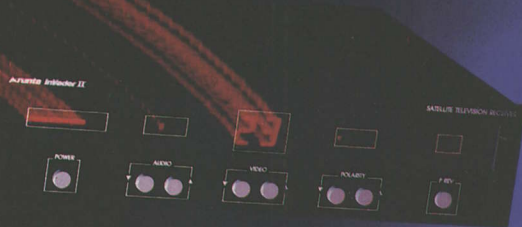
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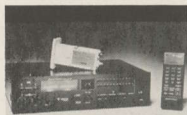
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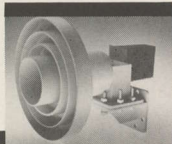


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COOP/ continued from page 89

at the present time, but as large as it is already, there is no room left for growth. That needs to be addressed. **The present division** of the board, between Pioneers, Distributors, Dealers and Consumers is far too heavily weighted towards OEMs. **Dealers are, in my view, the future of this industry.** OEMs will decline in numbers in the next two years, and their importance will shift offshore in the process. We need to be prepared for that happening, and to gradually shift the real power base to the Dealers and Distributors so that **American** distribution policy remains in the hands of **American** merchandisers.

The Executive Committee concept sounds good, but it has already proven to me that it is capable of being a 'Clique-That-Ran-Amuck.' When I had to come **to the Board meeting** to find out that we had changed **the name** of our trade association, and **I served** on the Board, something is terribly out of balance! In my view, we need to reappraise what power we have turned loose here and do something with the bylaws to recapture the power back to the elected board. Remember, **the membership** elects the board and **the board** elects the officers. The Executive Committee, **all officers**, were not elected as officers by the membership. Yet they run the shop. Strange indeed.

The SPACE concept, as presently practiced, makes almost no use of 'Committees.' As it now stands, everything done, investigated, studied, considered, and approved goes through a very narrow funnel consisting of just a handful of people. We have vast, untapped talent in the industry. We have **good** lawyers, **good** engineers, **good** technicians, **good** marketing people and so on. None of these people are being asked to help. **That must change**; we must have a far broader input-base and we must have more participation. I'd create an entire cadre of new Committees so that SPACE could be working on many different projects all at the same time.

What about the present members of the board? I have already identified four whom **I believe** are excellent people, who must cringe when they know they have to attend a meeting of the SPACE board. There are others on the present Board with at least the 'potential' to be capable industry leaders and administrators. How they sort out in the coming months will depend in large measure on how they conduct themselves in the interim.

I suppose that if I was writing a novel, I would look for an adverse reaction from those who 'know they have been caught.' I would look for **and expect to see** a counter-movement from a group that likes having things done their way; who feels that 'making money for SPACE' is more important than anything else, the hell with what is morally right and wrong. So I issue this warning, and, suggestion.

I have no intention of being a part of a 'negative political contest.' Any group I am part of will play the rules open and above board. There will be no dirty tricks, or, I will get out in a hurry. However, if I find that the 'other side' is stooping to dirty tricks, that they want to maintain their present status quo so badly that **they** are willing to drag the dirty linen of an entire industry out in public view, **I will feel compelled** to write about their activities, and make certain that **the voters** in the



DIRECTOR Wasburn makes a 'show-point'

industry **do know the truth.** There is no place in this industry for a continuation of past policies which have created division, anger, and waste of human talents. Let us all accept that the party of the past is over, and that 1985, under new leadership, will be a stellar year for our emerging industry.

SCPC and Marshall

I mentioned last month that back late in January I had put one **Marshall Foiles** to work at the WIV Grace Bay complex with a 12 page memo of things to be accomplished 'by Saturday.' Marshall has now been through quite a number of Saturdays and some of the early results are in.

Marshall has a job many would envy. He lives down here in the Turks and Caicos after growing up in rural Ohio. He came to the islands because an acquaintance had a construction job going here and there was a need for 'trained supervision' on the job. Marshall has several construction-trade qualities (he and wife Sheri recently completed the first phase of their 'do-it-yourself-house') and back in the 'old days' on Provo (circa 1980) a fellow who knew which end of a hammer to bang the nails with was in great demand. That was before the present construction boom where upwards of 400 people are employed on a single job and Marshall, like the Coopers, was a pioneer back when it meant something to be a pioneer here. Gawd what a difference a few years make.

"**You had to see it to believe it,**" he said to me one day late in March, walking back into the WIV production studio where I was slaving away on magazine copy for this issue. "**There were hundreds of people there!**" Getting hundreds of people to one place at one time here is like filling Yankee Stadium in New York. It takes some doing. He had just come back from video taping the arrival of our first regular, commercial, jet service; Cayman Airways had landed with a pile of dignitaries and he had the WIV ENG unit on the scene to 'film' the landing for future historians to study. We both told our favorite 'pre-commercial-jet' stories to each other for the upteenth time and then he cleaned up the video gear and stuck the ENG batteries back in the charger. I couldn't help but notice that here, where four years ago there was no electricity, no paved roads, no telephone and not much else we take for granted in the states, was a young guy in his mid-20's calmly wiping off an ENG video camera and making sure the gear was ready for the next field assignment. Life certainly changes fast.

In between building new dishes, riding herd on our growing staff, and keeping a total of 19 TV and FM transmitters operational 24 hours a day, Marshall has become the world's number one expert on SCPC on satellite. We equipped him with a host of receivers, a couple of dishes, designed a computer logging system for record keeping and turned him loose on the orbit belt. In a couple of weeks he had more than 150 FM/SCPC channels 'logged' and was busy deciphering who was where and when they were 'on the air.'

"**When do you want to start this in CSD?**" he asked me in mid-March. I told him I thought the May issue would be OK and suggested he have his initial findings to me in log form by 1 April. "**What do we do about the ones we haven't identified yet?**" he next asked. I suggested we sit on them until we had them identified. "**What about the National Crime Information Channel (NCIC) on radio teletype?**" he asked. "**Do we want the feds calling on Carol because we list where you can tune in the national hotline on every bank robbery and stolen car in the USA?**" I thought about that for awhile. I am still thinking about it. I will probably think about it for another month or so. I had been a part of a recent 'visit' with some FBI guys and hadn't recovered from that one yet.

Marshall's first effort appears here this month, on page 62. He worries about not being a 'professional journalist.' I told him that if he sticks to the listings and facts, I'd handle the journalism part.

The whole concept, briefly, is this.

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COOP/ continues on page 96



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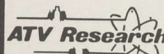
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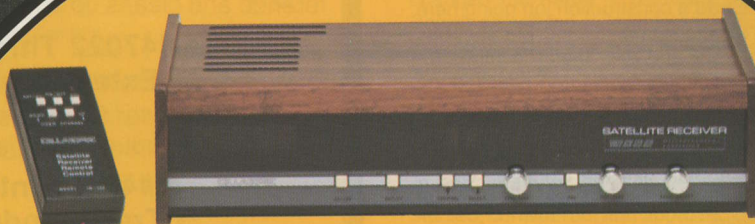
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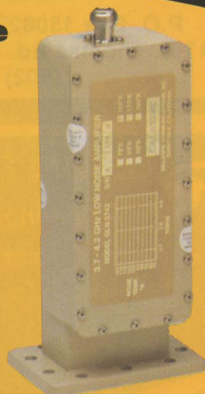
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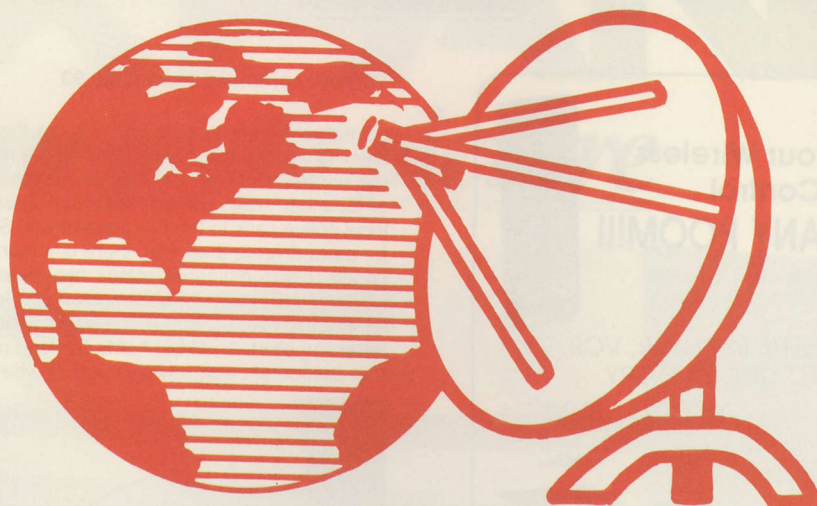
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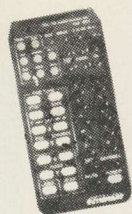
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COOP/ continued from page 93

seventeenth time that month. I have this vision that ultimately the satellite audio/data channels will be the next generation 'scanners in the sky.' Most of us know that companies such as **Regency** sell a ton of 'Scanner' type radios so folks can listen in on everything from the local police calls to the fire department. Satellite audio channels are far more diverse than that; there is a myriad of audio networks for a couple of dozen different states, two networks for Los Angeles Dodgers baseball (one in English and one in Spanish) and news from and for virtually every corner of the world. **Satellite audio is the ultimate listening post.** And Marshall is our lead man in making you aware of that excitement and advising you of what to look for, and where.



MARSHALL Foiles adjusting an Oscar 10 satellite antenna on Provo.

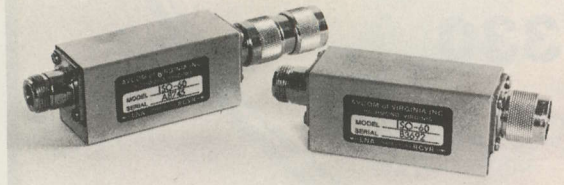
I know what will happen. Regency and a dozen others will come out with new FM/SCPC receivers. That's good; the present selection is expensive and not entirely adequate for what is happening here. Next some guy in North Carolina or Illinois will come out with a 'book' which will have been cribbed from Marshall's column and he will go on the newsstands with it and make 10 grand. This will take a year or less. All of it.

Marshall, meanwhile, wants to integrate our FM/SCPC listening post with our Fort Lauderdale office so people can call our Florida office after hours and get an updated report on which new services have popped up where. I have a plan that is better than that, but we have to walk here before we run.

"Some guy just knocked off a bank in Cincinnati. Come and read his description!" The description was so complete that if the bank robber stepped off of the next Cayman Airways jet onto Provo, clutching his ill-gotten loot, I'd have no difficulty spotting him. I'd advise bank robbers to mark Provo off their 'hiding place list'; the world just got smaller.

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Your customers already know KLM quality, now you can profit from our complete line of Earth Station receivers, antennas, & accessories that add convenience, performance and new capabilities to any installation. The more complete the installation, the more profit for you. KLM has consistently led the industry in design and marketability with our unique modular product line. The variety of receiver price ranges and our upgradeable system design adds unequalled

flexibility when tailoring installations to individual budget requirements.

To top it all off, KLM has implemented a nationwide advertising campaign spotlighting our individual components and integrated systems thru premium circulation Trade/Consumer magazines and newspapers, as well as point-of-purchase support and sales tools to make your merchandising program complete.

So stock up, the customers are coming.

Call your distributor or write us for details.

KLM **Electronics**
P.O. Box 816
Morgan Hill, CA 95037



SAT-TEC TVRO SYSTEMS

**dollar for dollar, performance for performance,
you couldn't offer your customers a better system**

Performance is built into the chassis of SAT-TEC components, not the panel. We *could* modify the panel to *look* more impressive. But that's not the way to get the results your customers want. So we put the quality they demand on the *inside*.

And SAT-TEC components *get results*. The R-5000 receiver delivers unexcelled picture quality. The S-5000 stereo demodulator provides dynamic stereo reception.

SAT-TEC performance is backed up by reliability ensured in extensive quality control that includes unique triple level board tests; receiver burn-in; and final, on-the-air checks.

At SAT-TEC, we've pioneered improvements in satellite technology to develop advanced systems incorporating tomorrow's features for today's market. Because videophiles are far and few, we've targeted our TVRO systems to satisfy the broader spectrum of the market—the group that wants

maximum performance at reasonable prices.

What's more, versatile SAT-TEC components are compatible with other related equipment, so you can put together economical TVRO packages that don't stint on performance. Your "do-it-yourself" customers will welcome our current limited fool-proof hook-up, too.

Dealers who know us have used our products more than any other in making up TVRO packages. You just couldn't sell a better TVRO system. So when you're looking for satellite TV systems, choose SAT-TEC. SAT-TEC quality can be seen.

For more information, contact your nearest SAT-TEC distributor.

SAT-TEC

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